June 1997

BOARDWATCH MAGAZINE

Guide to Internet Acce... ...rld Wide ...eb

UUNET Pulls the Plug on the Internet

Measuring the Network- Tools to Tell What's What

South Africa- Lighting the Dark Continent

Small Business- A Nearly Untapped Market

Verio- A Horse of a Different Backbone Strategy

John W. Sidgmore, Vice Chairman and COO (WorldCom), and President and CEO (UUNET)

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* VisionQuest 2000, April 1997

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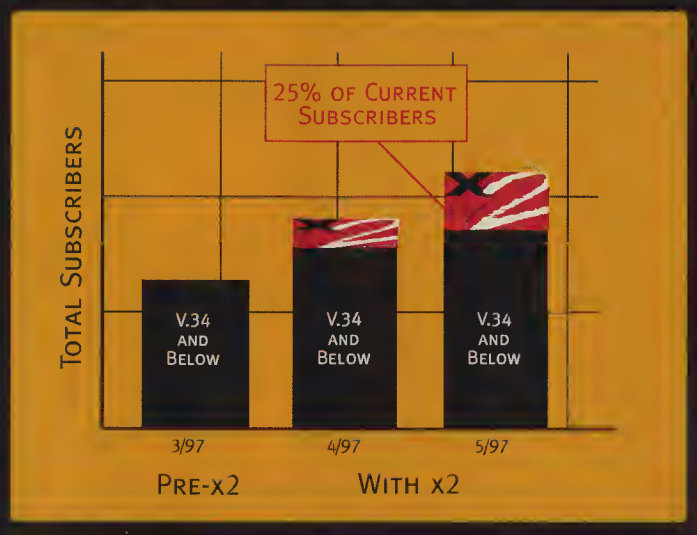

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BOARDWATCH MAGAZINE
Guide to Internet Access and the World Wide Web

ISSN: 1054-2760 Volume XI, Issue 6 JUNE 1997

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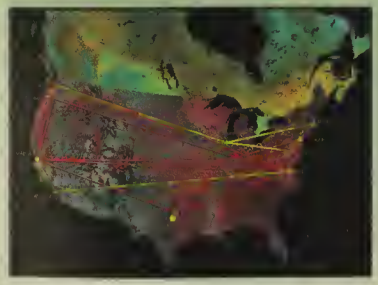

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Boardwatch Magazine (Issn:1054-2760) is published monthly at an annual subscription rate of $36. ($99 Overseas) by *Boardwatch Magazine*, 8500 W. Bowles Ave., Suite 210, Littleton, CO. 80123. Periodicals Postage paid at Littleton, CO and at additional mailing offices.

POSTMASTER: Send address changes to: ***Boardwatch Magazine***, 8500 West Bowles Ave. Suite 210, Littleton, CO 80123

Printed in Canada

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Cover Illustration: Marla Asheim

EDITOR'S NOTES by Jack Rickard

THE BIG, THE CONFUSED, AND THE NASTY

UUNET RESIGNS FROM THE INTERNET—US WEST EXPRESSES CLUELESS GREED AND CONFUSION, THE FCC RULES ON ACCESS CHARGES

This season continues to amaze, confound, and perplex nearly all on the Internet. We do appear to live in the proverbial Chinese "interesting times."

Let's do the easy targets just so I'm not accused of dwelling on the cripples unfairly. About a year ago Bell Atlantic issued a truly moronic "study" indicating that ISPs were unfairly tying up the voice switches in telco central offices across the land and threatening the very utility of the switched circuit voice network. I initially dismissed this as so ridiculous that surely no one could take it seriously. In the absence of any apparent protest, all RBOCs went into a full scale cottage industry of issuing repeats and further data on this notion. In our March issue, I finally addressed this and in an attempt to appear fair, published, in full, US West's preposterous reply to the Washington State public utilities commission — concluding that if they were sincere they should be MOST anxious to assist ISPs in moving to dry copper LAD circuits and deploying xDSL as an alternate means of Internet access. I rather know that even ISPs can't deliver this at the current popular rate of $20 per month, and it would have little impact on any of that. But US West of course didn't. In truly mindless knee-jerk fashion, within TWO WEEKS of the March issue hitting the street, their response was to apply in all fourteen states to remove LAD circuit tariffs. As these things work, this allows them to discontinue sales until it resolved in the PUCs. No LAD circuit sales after June 1, 1997.

I can think of no better demonstration of my concept of RBOCs as "manger dogs." They are sitting in the manger of global networking. They cannot themselves eat the hay, but they are desperate to prevent any who can from doing so. The only customers they can get for their own xDSL offerings at $175 per month, as it so happens, are those currently paying $650 per month for 1.544 Mbps T-1 connections. So they are about to cannibalize a VERY profitable data networking business themselves. It will have little impact on Internet connections aside from replacing the aforementioned $650 loops with $175 loops. But they have demonstrated empirically that the concept of anyone else using bare copper to offer services is anathema to them. Since this IS the model for competitive local access, they apparently not only don't mind being stupid and greedy in public, but they also intend to join the militia movement as totally lawless as well. The FCC is clearly going to have a tough time implementing the Telecommunications Act of 1996.

Worse, after collecting the money for all those second line installations, the RBOCs are preparing for competitive local access by basically letting their networks go to hell. And now they are blaming it on the Internet service providers. I tried dialing mom on Mother's Day, traditionally the busiest long distance day of the year, SEVEN TIMES without a connection. It isn't the Internet doing that gentlemen. While competitive access is tied up in court, the RBOC have essentially ceased investing in their networks and I have no doubt that the switched voice network will become increasingly unreliable. There is NO DOUBT they will then attempt to blame it on data networking and Internet service providers — don't believe it. It is a barefaced lie.

The FCC meanwhile, has unveiled their 1,100 page ruling on access charges and universal access. As I predicted, but still much to my relief, they did NOT bring Internet service providers under the per-minute access fees currently paid by long distance telcos. And they reduced those fees paid by long distance companies — not as much or as quickly as I would have liked to have seen, but reduced them nonetheless.

In the competitive local exchange carrier (CLEC) environment envisioned, the main concern is for the fate of "universal service." The theory is that new companies will "skim the cream" going after profitable business accounts while leaving the elderly, the impoverished, the rural, etc. to fend for themselves. I've never bought into the cream skimming theory, but it was very much in vogue even before divestiture in the early '80s. It was the MAIN argument against long distance competition. It doesn't appear to have had any impact at all in the reality zone. But that doesn't prevent the RBOCs from bringing it up again with regards to local competitive access. And so it has to be addressed.

The FCC did this with flat per-line access fees on second telephone lines — a little over $2 for residential lines and over $4 for businesses. This doesn't seem like much — but neither did the 3.5 cent per-minute access fee in 1984. This fee will come back to haunt us in gruesome ways four or five years from now.

But for the present, while it does increase costs for ISPs, it is more annoying than problematical. In fact, ISPs stand to benefit from it as a percentage of the proceeds go into a $2 billion fund to put libraries, schools, etc. on the Internet. My old buddy Dave McClure at the Association of Online Professionals, who we haven't ever been caught in the act of getting ANYTHING right the first time around, is predictably howling that this is the death of the Internet service business — unless of course they all immediately join the AOP. As best as I can tell, dollar wise it's probably a net gain for Internet service providers and depending how it plays out, potentially

a huge one. If it's entirely negative, it could drive a price rise of slightly over 40 cents per month in dial-up accounts — undetectable amidst the rounding errors without a serious investment in test instruments. If we throw out the top and bottom 10 percent of ISPs, it looks like about 10 million dial-up users and 1 million dial-up ports. At $4.75 per line, that's $4.75 million per month FROM ISPs collectively, and $2 billion going in their direction. Sign me up.

But the big issue of the day is boy genius John Sidgemore's amazingly cunning decision to DISCONNECT UUNET FROM THE INTERNET! In all honesty, I've been circling my office for two weeks scratching my, ahem...., ear..., and picking my nose trying to determine if I'm missing something here. There are two possibilities — Sidgmore is either the most brilliant man on the network and knows something no one else does, or he's pulled a boner the size of Idaho in public.

Basically, in March UUNET began sending a series of amazingly clear and at the same time totally cryptic e-mail messages to at least a dozen, and perhaps as many as 30 small backbones and ISPs notifying them of their intention to discontinue peering at various dates in late May and early June. They did allude to the fact that they might be willing to negotiate something if the ISP signed a FIVE YEAR non-disclosure agreement that would require a total frontal lobotomy to really be effective as worded. They can't actually say the WORD "Internet" in public for five years or they have infringed it.

All the secrecy surrounds proposals for these backbones to pay as much as $24,000 per month for peering at a Network Access Point — over a quarter million per year. This is, coincidentally, the approximate cost of a T-3 connection to UUNET as a customer. They basically intend to convert competing small backbones to customers or disconnect from them.

David Holub of The Whole Earth Lectronic Link questioned this and Bruce Katz, terrified of being "disconnected" by UUNET, — fired him. We found Mr. Holub's thoughts on the topic remarkably cogent under the circumstances and publish them in their entirety in this issue for your consideration. He brings up forty or fifty excellent points.

The UUNET public relations spin machine immediately went to work to portray this as the "end of the free ride for small players." Watching the general networking and computer media pick this line up unquestioned has exacerbated my ongoing and increasingly fully engorged gag/retch reflex with regards to the state of computer journalism today. It's a swamp. If you assume I'm a spraddle-legged whore with a numerically matching IQ and inseam, I forgive you. In the crowd I'm running with, how could you tell otherwise?

In any event, the number of "backbones" on the Internet has grown from about nine we could find a year ago to near enough 30 today. And it is quite true that many of them have made neither the dollar investment nor have the customer base that UUNET does. Some of them are pretty shaky. And a kind of AIDS hysteria has taken hold in that few want you to know that they have been "notified" for fear it will wreck their business plans. UUNET of course whispers to them that if they say anything, there will be no negotiations for peering. And so an insidious silence surrounds the issue.

To comprendo what is going on, you have to take a look at the peering issue. This is actually the THIRD episode where it has been used in an attempt to "steal" the Internet. And it is very interesting to go over the first two in order to understand this latest one.

In 1988, the Internet was a "backbone" operated under the auspices of the National Science Foundation to connect some supercomputer centers across the United States. It had existed as a 56 kbps network and in that year they upgraded it to 1.544 Mbps. Merit, a Michigan education and research entity that linked universities in the state, was chosen to administer the network. MCI and IBM joined forces to create a non-profit subsidiary titled Advanced Network and Services (ANS). ANS actually built the backbone. And they claimed to have both the public NSFNet backbone and their own private backbone, which were physically one and the same.

The concept of "privatizing" the Internet and allowing private companies to sell access to it was actually some time coming. ANS wanted anyone selling Internet access to pay THEM for peering to the NSFNet backbone. Rick Adams of Alternet (now UUNET) and Marty "Shaftsall" of PSI screamed like stuck pigs, threatened lawsuits, and cried like babies in public that IBM and MCI were going to "steal" the Internet. I can't make as loud a noise for as long as they did. And it was the first time I ever saw two people actually found companies on "crying" in public. Gordon Cook founded an entire new career in conspiracy mongering with an electronic (later printed) newsletter. The mailing list COM-PRIV was started from PSI, specializing in conspiracy theories with IBM as the spawn of the devil. The list grew to gargantuan size and popularity, espousing all the evils of ANS.

PSI and UUNET were actually the main forces behind the Commercial Internet Exchange. This was an equipment room in California that actually belonged to PSI. But the proponents declared that if you connected at CIX, you were connected to the Internet, and everyone bought into it. End of ANS aspirations to own the Internet.

But it was the beginning of little Ricky and little Marty's aspirations. In 1994, they announced that EVERYONE selling Internet access anywhere in the U.S. would have to pony up a $10,000 annual fee, whether they connected to CIX or not, or they would be "route filtered" at the CIX and they would be effectively off the Internet. They set themselves up as Internet Czar's and demanded annual tribute from every ISP in the land to the tune of $10,000. This then comprised the SECOND attempt to "steal" the Internet.

We editorialized on this topic in our September 1994 issue and in fact, I flew a hundred copies to Atlanta to the CIX meeting myself. We distributed them to all ISP attendees at the CIX reception (under the stairs — very poorly done reception actually) and spoke with most of the ISPs and CIX members attending. CIX's response was to close the meeting the next day to any non-members and most pointedly the press. The CIX board announced they were going ahead with the plan anyway, whether the members liked it or not and that route filtering would begin in November.

Karl Denninger announced that he had an equipment room in Chicago and he would be the CIX if everyone wanted. That was

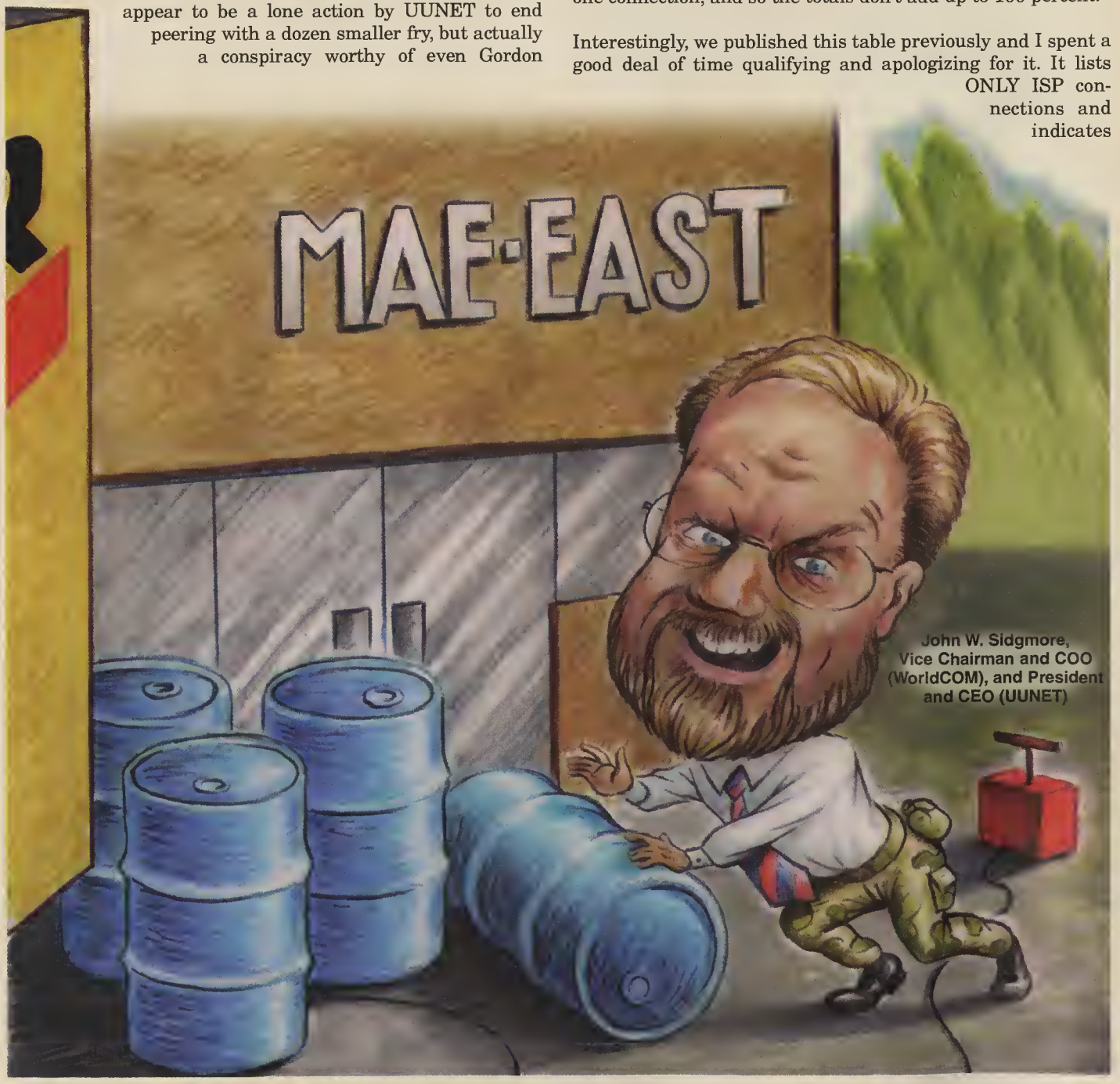
the last anyone ever heard of CIX route filtering, or the $10,000. The CIX move was dead on contact — not from Karl's actually establishing a CIX — just from his mentioning that he could. CIX has spiraled toward total irrelevance ever since. Last year, one of the CIX secretaries approached us about participating in the ISPCON in August '96. We told them sure, come ahead, do sessions, whatever. No grudges here. But little Marty and little Ricky, still on the CIX board of directors, and still nursing a grudge over the '94 editorial two years earlier, said "no way" and killed it. Not that we noticed at the show.

And as close as we can tell, John Sidgmore and UUNET have offered to be the front man for the THIRD run at stealing the Internet. And while it appears to be UUNET, we have already amassed sufficient evidence of collusion from PSI and SPRINT to probably send someone to jail, but in any event sufficient to pull together a really interesting class action lawsuit that could potentially cripple all three companies. This does NOT appear to be a lone action by UUNET to end peering with a dozen smaller fry, but actually a conspiracy worthy of even Gordon Cook among large scale backbones to squash the smaller players. And it mostly hails back to the same little handful of would-be czars that screamed at the first attempt, perpetrated the second, and now are very dishonestly pulling the strings on the third from behind the curtain.

What I DON'T understand is why otherwise supposedly intelligent individuals actually think it will work. There are two basic problems, aside from the obvious impairment of antitrust violations and government interference. First it's failed twice in a row previously. And second, if its a game of big fish crowding out little fish, neither UUNET or PSI are big fish.

Let's take a look at the second problem first. The table below shows some interesting relationships. We are listing the data we are closest to. That is, the number of Internet service providers who have connections to each of the major backbones in order of number of connections. Many ISPs have more than one connection, and so the totals don't add up to 100 percent.

Interestingly, we published this table previously and I spent a good deal of time qualifying and apologizing for it. It lists ONLY ISP connections and indicates



John W. Sidgmore, Vice Chairman and COO (WorldCOM), and President and CEO (UUNET)

market share among ISPs only. PSI, interestingly, doesn't sell connections to ISPs — the greed thing again. But we have coupled this data with some traffic data from various largish ISPs, and amazingly the traffic patterns overall match our ISP market shares to within hundredths of a percent — with the exception of IBM Global Networks. They have some 30,000 business customers, and almost no ISPs — largely a pricing and cultural issue. At this point, I think it DOES INDEED represent true relative size of footprint. This appears to be coincidental, but I suspect that the ISP selection of backbones almost exactly matches business selections of backbones, with the lone exception of IBM Global Network.

This data is from 3,852 ISPs with a total of 4,455 connections. It indicates that each ISP averages 1.1565 connections to backbones. There is some serious multi-homing going on already. Assuming an average price of $2,300 per connection and further dubiously assuming an average connection of a single T-1, this looks like about $125 million in annual sales to ISPs.

But that's not the point. If the game is to be let the big fish eat the little fish, we rather immediately see that UUNET and PSI aren't any of them. InternetMCI is roughly TWICE the size of UUNET and Sprint IP Services is half again larger than UUNET. PSI doesn't even break the 1 percent market share here.

Now what immediately becomes obvious is that if UUNET's move is successful, and the smaller backbones ARE squeezed out of the game, there is only one next most obvious move for internetMCI and Sprint — and it doesn't bode well for PSI and UUNET. UUNET may derive some comfort from the fact that they were bought by MFS, who was in turn purchased by WorldCom. Actually it won't help much. There is no love lost at the higher levels between MCI and Sprint toward WorldCom. Whatever the network architects participation at this point might be, if the UUNET move works, it's liable to come down from the TOP to do the same thing TO UUNET and PSI.

And therein lies my puzzlement. The one man on the planet who would naturally hope that UUNET's ploy would fail would have to be John Sidgmore of UUNET.

The heart of it appears to be a kind of child-mind approach to greed. The thinking is that the smaller fries are mucking up the Internet with low pricing. I doubt it actually. There is a customer at every price level, and if truly competitive, a world of five or six backbones will render prices that will actually decline over the next year anyway. Eliminating the smaller backbones won't do much to pricing unless you have a pretty firm plan to cooperate on prices among the backbones that are left. And there just is no honor among thieves.

Worse, unless it develops pretty quickly, it won't work anyway and for the same reasons that it didn't work twice before. The Internet is a belief system, and that's hard to claim to own. Each smaller backbone that UUNET cuts off loses precisely one peer. UUNET has just lost thirteen. Part of this is the uneven nature of customers. A YAHOO or a *Wall Street Journal* can be a powerful draw on the Internet — but they count as ONE web site and ONE customer. All web sites are not created equal. If one popular web site disappears from the UUNET customer's screen, this takes a bad turn.

And UUNET customers are paying a higher price for a supposedly "premium" connection. They were sold a connection to the INTERNET. That's what they thought they were buying. If UUNET disconnects from even a portion of that Internet, it is actually running a private data network — not an access to the Internet. And any bumbling $70 per-hour new grad lawyer can turn their customer agreements into so much waste paper with little effort.

UUNET has to be hoping that both internetMCI and Sprint IP Services jump in and join them in this effort. Even if there is collusion going on here, those companies have charts and tables nearly as good as mine. The customers to be had for them are mainly with UUNET, not with DataXchange, GoodNet, or Digex.

Finally, there is a very real threat of lawsuits and legal action. And all of this to eliminate a set of backbones that taken all together don't comprise 8 percent of the market or traffic. If I were a WorldCom shareholder, I'd be screaming for Sidgmore's head on a wall plaque at world headquarters.

But wait — there's more. Many of these new and small backbones owe their existence to a very interesting development. They don't actually use expensive point-to-point leased telephone lines from AT&T, Sprint, or MCI to connect their hub cities. They use much less expensive private virtual circuits (PVCs), rented from a massive ATM network operated by a company, as Mr. Sidgmore's luck would have it, titled WorldCom. While these backbones don't take much revenue from UUNET, they do provide a bit to WorldCom.

The bottom line is that UUNET, continuing in the tradition of its founder, has been too tricky by half one more time around.

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Q: WHAT DOES IT OFFER?

Our philosophy is centered around more services with less complexity. How? Through transparent scalable technologies that ensure long-term, non-disruptive network evolution; drive operational productivity at every level of the organization; and adapt to changes in network usage and business requirements.

Q: HOW CAN I INCREASE REVENUE AND MARGINS?

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Q: ALL RIGHT, WHAT IS IT?

Adaptive Networking is a set of products and cornerstone technologies that transition today's networks to the IP-optimized networks of tomorrow. The aim of Adaptive Networking is to build networks that are invisible to users, worry-free for network managers, and strategic for the business.

Q: WHAT ARE THOSE SCALABLE TECHNOLOGIES?

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Backbone	Connections	% of ISPs	% of total connections
internetMCI	1569	40.73%	35.22%
Sprint IP Svcs	1176	30.53%	26.30%
UUNET	811	21.05%	18.20%
AGIS	303	7.87%	6.80%
BBN	189	4.90%	4.24%
ANS	69	1.79%	1.55%
Digex	61	1.58%	1.37%
DataXchange	53	1.37%	1.19%
CWIX	45	1.17%	1.01%
Goodnet	45	1.17%	1.01%
PSI	31	0.80%	0.70%
NAPNet	23	0.60%	0.52%
GridNet	21	0.55%	0.47%
ATMnet	17	0.44%	0.38%
IBM	13	0.34%	0.29%
CAIS	10	0.26%	0.22%
NetCom	9	0.23%	0.20%
Savvis	5	0.13%	0.11%
CompuServe	5	0.13%	0.11%

How it plays out largely depends on the response of the customer community and the smaller ISPs. If life appears to go on as usual without a UUNET peering agreement, UUNET will find itself in a very awkward position. If the smaller backbones, with a large monthly fee going to maintain their networks, panic and sign up, UUNET will derive about $250,000 per year in gross revenues from them for peering agreements — about what they would pay as customers.

Spinning it hard as the "end of free Internet" probably won't help. UUNET wasn't giving anything for free anymore than NetRail was. They both appeared at network access points, and they both advertised each others routes to their respective customer bases. That is what an Internet is and in a nutshell what peering is. UUNET has taken the first steps toward establishing a private data network with the profound hopes that their customer base won't notice and that the smaller backbones will in any event panic before they do. That's a risky strategy with no upside that we can tell, and huge downside. If they have to back off, it will be very embarrassing. And if they win, internetMCI will squash them like a bug. And in the meantime, about a dozen millionaires are trying to decide whether to sue them or get the Justice Department to do it for them.

There is another side to all of this. There were a lot of very small regional players who had no national backbone at all trying to peer at the network access points. They probably SHOULD be customers instead of peers. The problem becomes one of drawing of lines. You don't want AOL dial-up customers demanding to dial-in to the NAP and "peer" with a 33.6 kbps modem for example. Peering does involve a certain amount of co-mingling of body fluids. In accepting route advertisements from a "peer" at a NAP, you are basically giving someone else the power to wreck your network. The concept of free for all peering just isn't technically plausible given the current architectures.

On April 25th, a few days after *Infoworld* columnist Bob Metcalfe "ate his column" that had predicted a massive collapse of the Internet sometime in 1996, MAI Network Systems received a "full view" set of routes from one of their customers who was experimenting with multi-homing. A couple of things happened as a consequence. MAI did not have adequate filtering in place first. Second, their Bay Networks BLN router apparently has a bug in it that caused it to disaggregate about 20,000 routes and spew them forth to Sprint. Sprint, who uses AS-PATH filtering apparently, didn't filter them out and instead promulgated them to the rest of the world. Some 20,000 networks as a result were blackholed into MAI for a couple of hours.

This is an unlikely series of mishaps operating in congruence. MAI is reasonably well respected within the Internet. They immediately unplugged, called the Sprint NOC, and were completely open and honest about what happened. The Net was hosed really for only a couple of hours as the result of quick action by MAI, Sprint, and a lot of cooperation among the netheads at the NOCs among them. But it illustrates that peering is really a comingling of network body fluids, and you can get sick from your partners.

But the solution is to publish a clear, consistent, reasonably time stable and definitive set of criteria for peering. MCI is doing this pretty consistently now — national backbone, presence at three out of four NAPs, 24x7 network operations center, published trouble escalation procedure, and some demonstrated networking expertise are the basic requirements. They can be a little slow to make the move, but they are consistent moves.

Sending secret e-mail messages with secret non-disclosure agreements, unilaterally dropping peering agreements, sucking up to the press with stories of ending "free Internet access to parasites" and otherwise skulking about in the shadows, is NOT the way to do it. And I would predict UUNET will pay the price, again, for these tactics.

To try to increase the level of comprehension on this peering issue, we've been busy building a peering matrix out of several vertical FEET of printed traceroute data. We think it will be an eye opener for almost everyone, including some of the backbones themselves. It's already gotten to be a bit detailed for ***Boardwatch***, so we're going to publish it in the next issue of our ***Directory of Internet Service Providers***. Looking at what's in front of me now by way of early work, I think it will probably cause cranial detonations across most of a continent on release.

One final note, the **Internet Service Providers Convention** (ISPCON'97) is scheduled for August 20-23rd at the San Francisco Hilton and Towers Hotel. As of this writing in the first week of May, vendor exhibit space is entirely sold out, we have more ISPs registered NOW than attended the event in August 1996 — and hotel rooms are already starting to look like a problem. Robert Pepper, Chief, Office of Plans and Policy at the FCC, has agreed to keynote with an address describing in more detail the ongoing FCC notice of inquiry regarding the Internet, as well as the new access fee rulings. We're out of control. More at **http://www.ispcon.com**. You're not going to want to miss this party.

Jack Rickard
Editor Rotundus

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Letters to the Editor

Boardwatch Magazine
8500 W Bowles Ave Suite 210
Littleton Co 80123

LETTERS TO THE EDITOR

Address correspondence to Letters to the Editor, *Boardwatch Magazine*, 8500 West Bowles Ave., Suite 210, Littleton, CO 80123; by fax to (303)933-2939 or by e-mail to `letters@boardwatch.com`

Hi Jack :

I am a small (make that minuscule) ISP in SW Florida, trying to create a local presence for users here to gain access to the Internet. Being a small, very rural, community creates a big problem - revenue! Trying to convince local business that they 'need' to advertise on the Internet is akin to trying to milk a chicken. Note: I have no idea where that metaphor came from, but the mental picture is frightening at best.

Okay, back to reality. Your expertise is obvious and your suggestions highly regarded (Now if you are buttered up enough). How does a small ISP go about getting some larger sponsors, advertisers, or, hey, someone willing to actually pay money (as opposed to chickens and first borns) to display their product on our pages?

It has been difficult, at best, to educate those here that, "Yes Virginia, there is an Internet"!

I just read some of the Letters to the Editor concerning the 'possible' takeover of Compuserve by AOL and how this will give AOL 850,000 ports and a 10:1 user:modem ratio. Now if I did my math correctly, and of course I did, that means that Compuserver presently has about a 5:1 ratio, or about 4 million subscribers. Even with this extremely low ratio added to AOL's presently reported 25:1, the math just does not add up to your 10:1 ratio statement! Calculations suggest an actual 14:1

Okay, you're going to say that I screwed it up somewhere in the number crunching! Possible, but then I will firmly place all the blame on the calculator.

Regards
Edward Whittaker
Owner, WWW.DeSoto.Net
`sysop@desoto.net`

Edward:
No, I probably won't say that you screwed up in the number crunching. The nuns teach numbers in a rather absolute sense. With regards to the Internet, they are more "virtual" and indeed if I understand the process correctly, you can make them up wholesale and get away with it. A kind of new math. With regards to CompuServe, the commercial online service doesn't actually have 4 million subscribers. They often quote rather high numbers that include some "CompuServe-like services" overseas, most notably NiftyServe in Japan. But in any event, they claim some 540,000 ports. This is a bit more complicated than the number of modems and subscribers. CompuServe actually has some very plush business in doing some rather boring things. For example, when you go into the department store and they swipe your credit card through the machine, it actually dials the Visa network to clear the charge. All the dial-up ports and indeed the underlying x.25 network is actually operated by CompuServe. And they have about a zillion of these little contracts.

In any event, also as I predicted, AOL doesn't have the cash to buy CompuServe, and HR Block is disinterested in trading CompuServe for AOL stock. So I don't think the deal is a happening thing at this point.

As to your chicken problem, a couple of notes. I almost tire of the constant litany of plans to get big companies to "sponsor," "advertise" or otherwise give people a business. Not only is it not that easy, but you don't actually want it. If you got it, you become owned by the large player, and pretty much have to dance to their tune — usually a badly off key tune. I would urge you to focus on smaller dial-up subscribers and small businesses. Sign up the small businesses at the $19.95 dial-up rate. GIVE them a home page, and then as they themselves discover what all the Internet bruhaha is about, offer them more e-mail, more web space, etc. — at a price. See our article in this issue on connecting small businesses to the Internet.

The lever you don't have is infinite resources. So play the card you have. You have few customers. That's an excellent advantage. It means you can afford to lavish extraordinary time and service on the customers you do have. And if they want to pay in chickens, let them pay in chickens. Then hold a barbecue.

My point is be positive and be creative. We had a period last year where everyone in the magazine industry was crying the blues — ad sales were down in every publication in the country. My ad sales guys came to me and said nobody wanted to buy ads, everyone complained they were too expensive, etc. and they were really having a difficult time selling them. My reply? Well if the price of ads is down, let's buy! We went out and tried to BUY ads from advertisers — shopping carefully for the lowest price. No one really ever sold us one, in fact they didn't even have a charging mechanism to SELL ads at any price. But several did then turn around and bought quite a few of them from us. They were somewhat stunned to hear we were BUYING ads, and when we explained that the price seemed to be down and it was a good time to buy, it caused endless mirth and merriment around our office — and theirs. My ad sales crew cheered up and had a lot of fun with it. And as you can see from the current issue, things have rather turned around at Boardwatch. We currently have an ad portfolio that is driving some of the larger magazines to distraction — all paid at full rate card I'm pleased to report.

My point is, be creative, be positive, and don't whine so much. Business can be a lot of fun, or a terribly negative experience. And the sole determinant of how that plays out is you and your attitude toward it. If the one you're working on now just doesn't turn out OK, don't worry about it. You can start another one tomorrow. You cannot increase your net worth, or even pay the rent in more timely fashion, by furrowing your brow, concentrating REAL hard, beating up your

vendors and customers for the last quarter in the carpet, or being "real serious" about it. This entire industry is taking on a bitter, negative edge, and I will predict that all the bitterness and all the negativity will not increase anyone's cash flow by more than about three cents per quarter, and actually, I happen to know that it drives money away.

So take it as your mission to put everyone in southwest Florida that isn't currently on the Internet, not only on it, but on it in useful ways for them. If you focus on that really hard, you probably won't actually ever get ALL of them on, but you'll probably build a pretty good Internet access business, and it won't be in chicken feed.

Jack Rickard

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NOT TO DISPUTE YOUR REVIEW, BUT...

Dear Forrest:

I fear I must take great exception to your product review of zipfolders in the last issue of ***Boardwatch***, especially having been the unwitting victim of a similarly favorable review. I downgraded the evaluation copy of version 2.02. I have to tell you I was intrigued by all the nifty claims to be made. However, the first annoying thing I noticed was that the program converted all of my existing zip files into proprietary "zif" files. Soon, my well tweaked and finally running like a top machine began crashing during use of the program, then any application having a now "zif" file. I was equally unimpressed when I called their technical support for help, with one slight reservation that I did not have to wind through a maze of automated answering machines and actually talked to two warm blooded human beings. My question for them was simple, when I uninstall this puppy will my old zip files, now "zif" files, revert back to their original nature, stay "zif", or be deleted with the program? Their answer gave me a tingle in a place I usually don't enjoy being tingled in, "I don't know, let's try it and see."

Well, the good news was they did revert back to their original extensions as zip, the bad news was yet to come. We spoke briefly about the circumstances and I assured them all TSR's were shut down when the program was loaded, however, I have a variety on my machine, such as MS Office toolbar, PC-Cillin II, Power Utilities, Second Nature wallpapers, etc. The support man asked what TSR's ran on bootup and seemed to loose interest at the anti-virus program, he then thanked me for my time and I thought my adventures were done. I then spent the next seven weeks trying to figure out what undocumented virus I had contracted off the web, until I finally figured out that my FAT files were corrupted.

Apparently somewhere in the loading or crashing of this program my registry files were corrupted for the FAT partitions, and then most everything after. Not only did I get what I paid for, but I got to reload Windows and everything else! Not to pick on you, but, your raves sounded more like a zealous rewrite of product propaganda than a satisfied user review. If, that's the case why not try breaking from the industry standard of pushing out product before it's complete, and be late a month in reporting your preliminary use results, or give it to Doug to shake up and down.

Sorry for the slap, but I didn't get warm fuzzies from this one. Next time I'll write something nice, but for now,

Best wishes,

Bryon S. Uding
`bsu@megsinet.net`

Bryon:

I'm sorry our review of this program has led you to ruin. We'll try to be more thorough in the future. What we are finding is that the same program can react very differently to different machines running different releases and configurations of Windows. I think Microsoft has done us a grave disservice in dropping the version numbers we used to all use with DOS, in favor of "builds" with significant changes and no notification. I'm sure it decreases their product support costs, but the result is that we no longer have a "common" platform.

Jack Rickard

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BEING IN THE ROOM WITH ELECTRICALLY POWERED DEVICES...

Dear Jack:

Catching up on back issues of ***Boardwatch***, I noted with interest and read aloud today to my staff your following prediction for 1997:

"A new band of increasingly non-technical and uninformed consumers will want a connection in 1997....it will be obvious that some people are just not meant to be in the room with electrically powered devices — much less on the Internet."
(Boardwatch, January 1997, page 9)

As if to prove this very point, look at the email I just received (attached below).

By way of background, 2 COW HERD (the ISP I run with my partner, Tom Carr) offers pre-configured MSIE available for download from our web site, which (naturally) has our web site configured as the default start page. This start page, located at: `<http://www.2cowherd.net/contents.html>` has a prominent link to step-by-step instructions on how our customers can finish the customization process for their email settings. We also send each and every customer a greeting message to which we request their reply. In this way we can check their email settings to make sure they have "gotten it right".

==Start: Actual Message Received==
>
> Received: from 56.los-angeles-009.ca.dial-access.att.net
> (56.los-angeles-009.ca.dial-access.att.net [207.147.208.56]) by
> mail.2cowherd.net (NTMail 3.02.13) with ESMTP id Deb.Howard for
> <Deb.Howard@2cowherd.net>; Fri, 9 May 1997 17:34:26 -0700
> Reply-To: <EmailName@2cowherd.net>
> From: "Your Real Name Here" <EmailName@2cowherd.net>
> To: <webmaster@2cowherd.net>
> Subject:
> Date: Fri, 9 May 1997 17:32:09 -0000
> X-MSMail-Priority: Normal
> X-Priority: 3
> X-Mailer: Microsoft Internet Mail 4.70.1157
> MIME-Version: 1.0
> Content-Type: text/plain; charset=ISO-8859-1
> Content-Transfer-Encoding: 7bit
> Message-Id: <00342654602402@2cowherd.net>
>
> Have no idea of how the 2 cow herd website got on my computer but I do not
> wish to have it loaded on my computer, kindly tell me how to get rid of it.
>
> ==End: Actual Message Received====

If I had a *valid* email address to which to reply, I would mention to this person how we stealth ninja ISP owners routinely perform home invasions into unsuspecting Internet users' computers in the pitch of night to load our websites onto their computers. I would also share my considered opinion that s/he should be encouraged to *NOT* make any further contributions to the gene pool...

Before I joined the "HERD" full-time in August 1995 to start-up our ISP division, my partner had managed our business as a computer VAR since August 1991. When he regaled me with "luser" stories, I truly thought he was lying to me. Now I know better...

And if I had a dollar for every end user from WebTV, AOL, AT&T, etc. who has tried to consult 2 COW HERD for free tech support, I would by now be prominently featured on the Forbes "Richest People" list...

Laughing so I don't cry, I remain,
Sincerely yours,
Deb Howard
2 COW HERD, Venice-CA's Original Full Spectrum ISP
(310) 448-1680 (phone)
(310) 827-5355 (FAX)
`http://www.2cowherd.net`
`deb.howard@2cowherd.net`
President, Internet Service Provider's Consortium
`http://www.ispc.org`
`http://www.euro.ispc.org`

Deb:

It's a scream all right. So an AT&T WorldNet subscriber found your support site, downloaded a new version of Internet Explorer, and wants some support to get your web site off their computer. I love it. But I would point out that this person may indeed be your customer in the future, depending on your reaction to their "lostitude."

We first noticed this phenomenon in 1988 with regards to Trintex, which became Prodigy. All of the BBS operators of the day were sure Prodigy was going to come take away all their callers with their "unlimited" access at $9.95. In practice, Prodigy became the training ground for literally millions of people who came on their service in response to television commercials etc. and later graduated to the more varied and even less costly electronic bulletin boards.

We're seeing the same evolution today in some more direct ways. AT&T, CompuServe, AOL, and Prodigy as it turns out, have all pretty much thrown in the towel on the old model and are now Internet service providers with content. But in deference to McLuhan, the medium IS the message at this point, and we're seeing hundreds of thousands of these people again "graduate" from the large services to ISPs such as yours. I rather relate this to the classic "formative stage of an industry" where anything anybody does helps all participants. When AT&T runs that commercial with all that asphalt flying through the air, they are drawing new Internauts into the online community, and a perhaps unfair percentage of those will be migrating to services such as yours after preliminary training at the AT&T school for Internovices.

I would counsel treating the lost and clueless with some kindness and consideration. And to some degree, yeah — even free "support" even though they're not your customer. It takes a certain generosity of spirit to prosper in the online community. Every time I say that everybody says "yeah sure." But it has always been true and you can easily reconnoiter the Information Highway for the rotting carcasses of all of those who didn't comprendo this one key theme.

That said, there are limits. And yes, some people just shouldn't be allowed in the room with electronic devices.

Jack Rickard

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PHONE RATES

Jack, thought you might be interested in the latest tariff changes here in the Bellsouth Operating area. They slid through a tariff change last October with no publicity. As of last fall anyone who sets up a hunting group of more than 3 lines is now charged commercial rates (two and a half times residential rates). More than 8 lines in any residence means any additional lines are charged at commercial rates also.

We were getting ready to add 4 lines to a RAS dial-in server that I run for friends and relatives in order to support a local Arts Group to help them train artists in Internet use. But adding even one line to my existing lines converts all of them to commercial rate lines. (Which means the end of the Arts Group project.)

A friend was going to set up an 8 line BBS here at my house so that my son could help him learn to manage it but the lines would all be commercial so that BBS was just aborted prior to birth.

With 2 4-line hunting groups already in and a couple of voice lines I can't even add lines for my kids without paying commercial rates.

They worked a fast one. They avoided publicity by grandfathering all the existing lines so no one was aware of the change to protest it.

In short Bellsouth has killed off the BBS community in the entire Southeast by ensuring that no new BBS start up. Interestingly there has been a resurgence of interest in local BBS because of the impersonal nature of the Internet and the local BBS community is not only alive and well but there have been a lot of folks calling me about starting them. But it appears that is not going to happen now.

`rocky@bham.net`

Rocky:

Sounds like quite a group of lines they didn't sell then doesn't it? This hasn't mattered much in the past, and probably doesn't now. The telco types are walking around in pretty halls and having meetings every day to determine how to dig the final quarter out of the carpet and shut down anyone that might be doing anything without their tapping a line into the cash flow.

But I'm OK with that believe it or not. I first called for competition in the local loop in 1988. And I think my dream is coming true. It will be fought every step of the way. But the outcome is pretty clear. And the people who made this move do not have sufficient intellect to play in the game of the future. They are dinosaurs, and they are a bit bitter about being dinosaurs. I think we'll see a lot of ugly things from them as they expire. I rather trust that Arts Groups will survive. But BellSouth won't as we know it, and most of those people will go from $125,000 per year jobs to handling the video returns at the local Blockbuster over the next few years. You'll get to watch their pain on a series of television news magazine stories. I watched it happen in the defense industry, and we will see it among the RBOCs as more entrepreneurial companies come into play — actively seeking such business.

Jack Rickard

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Jack,

Great mag. I've been a subscriber to ***Boardwatch*** since the heyday of the BBS, when we all thought that Worldgroup would takeover AOL. Alas, "Inter" the Internet and the whole world changes... everything except the name of the mag. I know that once upon a time, ***Boardwatch*** meant just that, but you won't find much any more about Boards in ***Boardwatch***.

I happened to glance down at the copy that just arrived, and for some strange reason, it just didn't look right, so I took another look at the cover and it dawned on me what was out of place.

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EUDORA™

New and improved Eudora Light 3.0 features include message filtering that offers the power and flexibility to efficiently organize and manage large volumes of email in seconds. Advanced drag-and-drop capabilities make text manipulation and adding file attachments easier than ever before. Live hot links automatically open any Internet application from within the email message. Eudora's new Extended Messaging Services Applications Programming Interface (EMSAPI) makes it easier for other software applications to integrate into Eudora software. These are just a few of the many great features the new Eudora Light software has to offer. The Eudora ISP Partner Program is a true win-win situation. To get more details call us at 1-800-238-3672 ext. 27112 or email us at eudora-salesisp@eudora.com **or visit our web site at**

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You changed the caption under ***Boardwatch*** from "Guide to BBS..etc." to Guide to the Internet Access and the World Wide Web. Why not go all the way and change the mag to NetWatch.

Anyway, just my observation. No matter what the name, it's still a great mag and you are still the most major Editor Rotundus.

Best Regards,

R. Craig Porter
TriPower & Associates, Inc.

Craig:

Well, the truth is it wasn't all that great a name in the beginning ten years ago. It's just a recognizable word nobody else wanted and we've had it for a long time now. Name changes are a lot of bother, and if we have to rely on a catchy name to serve our readers, I think we've rather missed the point. If we can assemble some information about this industry within our pages that you find valuable, my theory is that you would read it if we called it Bored Wives Magazine. And if we don't, sprinkling the Internet word all over the cover in 64 point type probably isn't going to help us much in the long run anyway.

I admit I could be wrong. But what the hell does Coca Cola MEAN anyway? And there's that 7Up thing too. Why 7? Why not 6Up? And Motorola. Do they actually DO motors? And Cisco...wasn't that a guy in a Mexican cowboy outfit? I actually know where US Robotics came from. But do they actually MAKE any robots? Or positronic brains? 3COM. Did they invent sticky notes?

We're real used to being called ***Boardwatch****. If we changed our name to NetWatch, first, there would be 300 people jump out of the woodwork noting that THEY first coined the term. Second, we'd receive 3,000 phone calls from people asking if we used to be* ***Boardwatch****. And I'd actually get a few e-mail messages from those noting that we were simply copying a magazine from "way back" they used to read called* ***Boardwatch*** *— now THAT was a real magazine.*

Boardwatch *is a small club. You get it or you don't. And most don't. I guess I'm OK with that. I like the people who read us, and the industry we cover. And from my point of view, nothing really much changed. The same things got different names. But it's mostly the same people, doing the same things, for the same reasons. If all the people who run Internet access businesses used to run bulletin boards, and now want to call it something different, I'm OK with that. If all the people calling bulletin boards now use the Internet, and are enamored of new nomenclature, I'm ok with that. If you want to then say that the Internet killed off bulletin boards, I'm actually amused at that just by counting the bodies, but I'm OK with that. But it's my magazine, and I'm calling it* ***Boardwatch****, and that's that. And if you don't get it, go get a copy of* Internet World*, and learn how to find a "burp gun for your cat" on the World Wide Web.*

Jack Rickard

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Jack,

This may sound like a simple question but I have asked many people and have not found the answer. What effect will 56k modem users have on the average ISPs aggregation model? What number of 56k modem users can a T1 support as opposed to 28.8 users? I understand this is not an exact science but I trust that if anyone has the answer it is you.

Thanks!

Kevin Johnson
`kjohnson@kc1.net`
KC One Internet Services, Inc.

Kevin:

I don't actually. The obvious answer is half the number of 28.8 kbps connections. And so we can pretty much guess that it will be any number but that.

Basically, the entire efficiency of packet data communications depends on a statistical multiplexing of bandwidth. With 28.8 kbps connections, we like a 4:1 ratio. That is that for four 28.8 kbps dial-up ports, you need 28.8 kbps of connectivity to the backbone. Experimentally, we've found that having a "better" ratio doesn't actually improve perceived performance. Ratios below that cause perceptions of delay. But it is highly variable depending on what you are doing at the moment.

This varies pretty widely depending on a number of factors. First, it works better on large samples. If you have 600 dial-up ports, this works much better than if you have 15 dial-up ports. The heart of it is that with four people browsing the Web, sending e-mail, etc., a good part of the time they are not consuming ANY bandwidth. They are staring at their screen on their own computer. When they click on a link, they briefly consume quite in excess of 28.8 kbps. All modems now use V.42bis data compression and web sites and e-mail tend to be extremely compressible. Indeed, we regularly measure 80 kbps of data flow on 28.8 kbps connections.

The magic is that if they use 80 kbps of bandwidth in downloading a page, they are "using" the bandwidth for a third of the time they would if they were not using compression and were using it at a 28.8 kbps rate. So despite using more bandwidth than you would think, they aren't using it for as long. As soon as their transmission ceases, another user has that bandwidth available.

Taking the 1.544 Mbps rate of a T-1 and dividing by 80 kbps, we get roughly 20 channels of 80 kbps. At ten active users per channel this corresponds roughly to 200 ports on a T-1. And this corresponds to what many ISPs report — about 200 ports on a T-1.

If we increase the data rate to 150 kbps — probably realistic with the 56 kbps performance we are seeing, we only get 10 channels. The statistical multiplexing probably goes up — let's guess at 15 to 1. This would indicate 150 ports on a T-1. But this assumes that all callers will be 56 kbps callers, and that all 56 kbps callers will actually get a good 56 kbps connection.

Jack Rickard

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HI JACK AND COMPANY,

First, the obligatory huzzah in recognition of ***Boardwatch's*** supremacy as THE ISP trade rag. We're a mom and pop outfit in Santa Cruz, CA, (which must have the highest per capita of ISPs of any place on the planet, jeezuz...) and look to you folks for real info and no hype. Thank you thank you thank you, the rest of the fourth estate seems to be printing out raw press releases from large companies which track no reality I am personally familiar with and are useless as Real Info (TM). (My favorite: "Soon Internet Service will be a $2.00 monthly add on to your local phone bill." a quote from an RBOC VP of something or other.)

But to business:

We're totally mystified by what AOL is doing. It's hard to imagine a billion dollar company run by college educated MBAs thrashing like this (they _must_ have a plan, but what _is_ it?). Are they fiendishly clever or ... you know ... stupid.

The only thing I can come up with is the difference in mission between small ISPs like us and the big 'uns like AOL,

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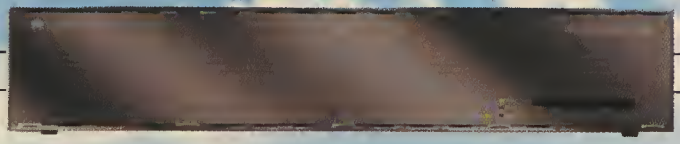

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MSN, etc. Our mission is to provide low cost, as-reliable-as-possible-please-Mercury-don't-go-into-retrograde service as possible. Their mission appears to be to sell a large audience to advertisers. Thus, we listen to our customer base (the users) and the large online companies listen to theirs (the advertisers).

Could you share a short bullet item sort of outline on what you think their plan, if any, is? And what the other big providers are doing and why? I mean, _channels_? Where did _that_ come from? And how come AOL's stock price is so high?

Another possibility comes to mind, but it involves too many people in the online service executive class and investment community doing massive amounts of hallucinogenic roots from South America, and my contacts down there assure me this cannot be the case.

Thanks for shedding any light on this,

Chris Neklason
Cruzio CEO

(note, if you print this, please do not include my email address, I don't want it to end up on some CyberSell spam list...)
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Chris:

AOL has been in a tough position. Their plan, whatever it was, changed. ISPs won. Contented commercial online services lost. But the machine is a bit awesome. They have amassed eight million users through some profound marketing. But the acquisition costs are high, and so is the churn rate. To stem it, they became an ISP in December — with little clue as to what that meant.

The attraction, and the stock price, reflect a fascination with the channel concept. They do have eight million warm bodies. And there ought to be a business in there somewhere selling them something. And believe it or not, predating the dial-up port problem, there were a lot of people who wanted a "little bit of Internet" — an easy to use e-mail program and to hang out in the motorcycle discussion group.

This reflects a couple of concepts here. First is the concept of community. This is what drove online services for years. People didn't want access to any thing, they wanted access to each other. Small groups discussing cockatiels, Harley Davidson Motorcycles, archery tournaments, etc. is the heart of the value of the online experience. It's not in vogue today as we all thrill to the next great technoflash across the screens. But it will re-emerge as an important aspect in the future.

Second is future market share. I can't find anybody interested in making money. They are all buying equipment to handle all the new customers they are going to add next year in a frenzy for "future market share." It is the main motivator in the business right now. Even among hardware and software companies, the products are nearly free — if they can gain market share.

AOL has eight million bodies and growing. That represents future market share. Given the problems they are currently having, I think it is a very weak play. But that's the plan. Currently, AOL is trying to attract advertisers as a way to make up the lower per user revenues they now enjoy. Since any of those AOLians can tap any web site as easily as anything on AOL, I don't know that this will work. And experiments in ads in e-mail have not been encouraging in the past.

I would sell their stock short, but the industry is so crazy now that somebody might try to acquire them.

Jack Rickard

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UNUSUAL COMPLIMENTS

Jack,

I think that your magazine is simply excellent, but never *bothered* emailing you my compliments. You receive so many already I thought one more would not matter. But after reading your response to Giancarlo, the Italian desperately asking for a job in the May97 issue, an even greater admiration has developed, and I can't refrain from writing this.

With all my heart, please accept my most sincere compliments for your humanity and generosity.

Regards,

Roberto Franceschetti
`roberto@netwide.net`

Roberto:

They all matter Roberto. That's rather the point — and the secret. The perception that we are all numbers in a world of money is cynical, but more importantly it is simply not true. Every e-mail, every contact, every move of your hand leaves ripples in a pond of humanity with effects we cannot predict — unintended consequences that now have the power to span continents and populations worldwide. It is the desperate whisper of the devil that persuades us we are weak, inconsequential, that it doesn't matter, and that there's nothing we can do about it anyway. Even small random acts of kindness have enormous power. The devil knows it. And I know it. Apparently you know it too. There are few...but the few grow....

Giancarlo hasn't shown up for work yet. But you never know...

Jack Rickard

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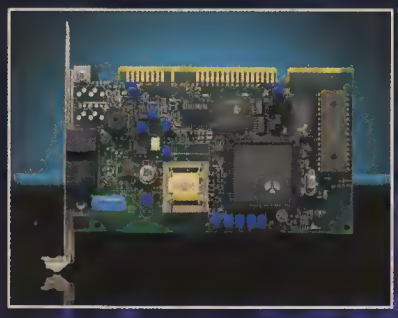
Jack,

After reading the article in the April issue of Boardwatch about AT&T's wireless telephone distribution system I thought of an idea that must be obvious to a lot of people besides myself.

Recently I was talking with AT&T about using their local phone lines and services and was told that the dates for having the lines and services available in our area had not been set yet. Which I took to mean that they want to compete with the local telcos and as huge as AT&T is it does not have the resources at this time to be present everywhere and in particular my area.

So here is the premise (1) AT&T wants to compete on the local level and has some new technology to do so. (2) Thousands of ISPs (Rusty Pliers) are going to be at ISPCON in August ready for new opportunities and making deals. (3) Millions of telco subscribers are wanting the chance to have a choice and/or more capabilities (for all kinds of reasons). The whiz bang deal is: AT&T recruits ISPs to become authorized installers with AT&T getting all voice line subscribers and giving the ISPs the opportunity to be the Internet provider of choice. Suddenly AT&T has a local presence everywhere, ISPs have an additional value added service, customers can connect at ISDN speed and have a choice. Win, win, win. Is this too simple?

I say that from all the new connectivity technologies that are emerging (copper, cable, fiber, wireless and satellite) the company that can implement the widest coverage the quickest with the costing and features being reasonable will clearly be a winner.



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What do you say?

Dan Krotzer
Dank@pcturnkey.com

Dan:

Sign me up. Yes, it's probably too simple. Why don't you just set up wireless access to the Internet, and let them do voice over it. You can do this while AT&T is "getting ready" to deploy in your area. We'll have several wireless players at ISPCON.

Jack Rickard

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x2.....NAAH SO-FAR ITS x0

Hi Jack. I loved your editorial on the 56k mess (A Bird In The Hedge, April '97). I thought I would relate my experience with X2 so-far.

As you already know, many of us who purchased USR sportster modems were told that the upgrade would be available in January '97. Naturally, because of my experience in this industry, I was slightly skeptical. As I expected, USR did not deliver, and, still to this day has not sent me the promised e-mail notifying me of the availability of the X2 upgrades (even though I purchased one a week ago). At first, the USR rep I spoke with told me that I would receive a software upgrade. This information I think was simply a mistake, because of the nature of my #840 modem. The next time I called, I was told I would receive an upgrade chip, and drivers.

This is what I expected. However, when my friend at Comp-USA informed me that the upgrades had arrived, I was told that it was a replacement modem. This was not a big deal, except that I had to make a second trip back to the store with my old modem to make the exchange. CompUSA gave me a $47 credit for the old one, and charged $107 for the replacement. A difference of $60. At least that was correct!

On installation, Windows95 identifies the modem as a 33.6 sportster, and continues to "find" it on startup everyday. I have solved this by simply updating the driver for the old modem, but I believe that they have forgotten to change the modem id in rom. Then, I started to look for a way to test it. I called about a dozen ISP's to ask about availability of a 56k dial-up. All of the ISP's I spoke with are supporting X2 exclusively (AT&T was one of them surprisingly), but are currently testing the protocol in major cities only.

AOL gave me an 888 number to try, but my AOL dialer returned the error: "no carrier signal", even though I heard one loud and clear. USR's own BBS which is supposed to support X2, returned the message: "connected at 28.8Kbps".

I want to tell you that this works, but I can't. I will keep you posted.

My own local ISP is going to support X2 so I will wait for him, and work with him on setting this up. I hope its just that I've done something wrong, but so-far my experience has not been good.

Once again, thanks for the great editorial!

Neil Goldstein
G1 Technology
neilg@mhv.net

Neil:

In the rush to market with these 56 kbps modems, a lot of very strange things are happening. We've been trying to test it for some time, with little success.

First US Robotics sent out thousands of 56 kbps Sportsters to journalists across the land, complete with a POP in Illinois where you could call to test the connection and see for yourself that it worked. I laughed out loud when we got it and put it on the table in the conference room. We didn't even break the shrink wrap on it. But I was amazed to see reports springing up in supposedly knowledgeable computer publications all over the land that x2 doesn't perform very well.

The basis for the 56 kbps modems, as we explained in gory detail in our January issue, is that the use of modems have changed. People now dial an ISP almost exclusively, and it is almost always a local call. The architecture of the telephone network is interesting in that this offers the opportunity to reduce the number of conversions made in the call. That's why we can do 56 kbps — or at least higher data rates than 28.8 kbps.

But it would be terribly surprising if it worked on a long distance call. This is because there are many additional conversions in connecting a long distance call. These tend to be digital to digital conversions, but they still take their toll. That US Robotics PR efforts were insufficiently informed to avoid this obvious problem was surprising. That supposedly knowledgeable computer reporters actually tested it and reported the results is actually alarming.

We did receive an MP-8 box from USR and three Courier modems. Unfortunately, the MP-8 came complete with a box of cables and accessories that was totally empty. They've promised to send them real soon now. We are simply not going to report any test results until we've tested them, and have some results to report. And at this point, I haven't a clue what will happen. We're hearing some very encouraging things from ISPs who are playing with this technology. I suspect we will find it more successful than most of the K56flex proponents would wish, and somewhat less successful than we would wish. But we'll see.

Meanwhile, user reports from the field such as yours are MOST welcome.

Jack Rickard

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Dear Jack,

Thanks for the best magazine I have EVER read! I'm a 7 year loyal customer. As an ISP in Western NC your magazine has, without a doubt saved me hundreds of dollars. Next to the Bible, your magazine is by far the best food I have ever had the pleasure of reading.

At the time of this writing I just found out that the Telco's won the right to charge customers up to $1.50 a month more for each additional phone line installed in their house.

As an ISP I know this debate has been going on for quite awhile between the FCC and the Telco's. I went to the FCC web page at http://www.fcc.gov but it's about as clear as mud. I need you to please read through this muck and tell me if we ISPs won. I knew somehow we or the customer would not get off scott free. I think I understand I will have to pay an additional $41.20 each month since we have 103 dial-up lines. In this a victory? Is this better then the per minute charge that was originally proposed? Did we win?

Sincerely,

Steve Moody
AlphaTech On-Line
Web - http://www.a-o.com
E-mail - Sales@a-o.com
Phone - 704-687-8848

Steve:

We won pretty big time, fella. The per-minute access fees would have really changed the Internet service provider business. I've been told by a about a

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dozen "knowledgeable industry insiders" that the per minute fees were going to happen. I didn't think they would. They didn't. I win.

As to the per line fees, I have mixed emotions about them overall — but they'll probably be good for ISPs. At a couple bucks per line, I can't imagine a single end-user pulling the plug on their modem line. True, ISPs will have to cough a bit more for their lines. Over time, I think the advantages of a competitive local telephone structure will decrease prices to more than compensate.

Meanwhile, a portion of this "universal access tax" will be used by schools and institutions to make the Internet connection — to ISPs as it turns out. This is a $2.2 billion fund to pay 90% of the costs of connecting 100,000 classrooms to the Internet. So overall, I think it is a big win for Internet service providers.

Across the bigger picture, I'm not so sure. We keep loading telecom with these mandated items with dollar figures on them. The per-minute access fee paid by long distance telecos to RBOCs was a pittance in the days of 22 cent long distance. In the dime world, it is MOST of it. In fact, I'm convinced its the only thing preventing flat-rate long distance service.

Currently, we are watching as a veritable forest of PCS antenna masts is springing up in our vicinity. I'm encouraged because of the possibility of true competition with cellular, Sprint wireless, ATT Wireless, and US West PCS will undoubtedly drive the per minute charges of cellular access down dramatically. But when it does, it will hit a rather brutal floor built on those wonderful spectrum auctions everyone is so delighted with. In the future, they will be viewed as the rather hard rock on which some large players broke their backs. They paid too much for spectrum based on business plans that had the wrong penetration figures, the wrong market shares, and the wrong per-minute prices.

So the flat per-line tax will likely have a similar future. A few years from now, you'll be paying $8 per line — because $5 of it will go to taxes.

Jack Rickard

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MORE X2 HEDGING!

Jack,

I enjoyed your editorial on the 56k situation. Having worked a few years in Quality Assurance at a fax/modem company (and leaving very recently), I'd say you've painted an accurate picture of the uncertainty with these new standards.

Just to make you aware, there's another modem company who jumped on the x2 bandwagon, actually back in March. Their name is Global Village. They're still small in the Windows space, but they drive the whole Mac modem market. They have a very strong AT&T (Lucent) and Rockwell history, but here's a link to their Windows x2 announcement and then another to the product description...

`http://www.globalvillage.com/press_release_text/pc/win56kpr.html`
`http://www.globalvillage.com/56k/winx2.html`

Also here's a link to their announcement of a -DUAL product line- (x2 AND k56flex) for the Mac, and a link to the product descriptions...

`http://www.globalvillage.com/press_release_text/mac/56kintropr.html`
`http://www.globalvillage.com/56k/macx2k56flex.html`

I suppose this is just another example of companies hedging their 56k bet.

Thanks for the good reading.

Dave Jorgensen

Very interesting Dave.

Thanks. We'll have a look see. A "dual standard modem" mayhaps? Now who would have thunk it?

Actually we've got something else coming your way in modems. Dual-line modems. Modems that use two analog telephone lines to achieve 70 kbps (really) or 112 kbps (dual 56kbps modems). They bond the two lines very similarly to ISDN, but work on regular analog lines where ISDN isn't available.

There's something every day.

Jack Rickard

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POSTOFFICE

In the May 1997 issue of ***Boardwatch*** you inquired about NT4-based Internet mail servers. Jack recommended "POSTMASTER by SOFTWARE.COM". I'd like to second the recommendation and offer a bit of clarification.

The name of the product is actually Post.Office but Jack was right, it's by Software.com <`http://www.software.com`> Basically it's a POP3/SMTP server than runs as a native NT service. Configuration is handled via a series of interactive web pages (it includes it's own custom web server) that are protected by passwords. Depending on your configuration, you can create accounts from work, home, or while on a business trip across the country.

Features include multiple addresses per account (Aliases), configurable mailbox size limits, vacation messages, and autoresponders. The latest version, 3.0, was released in April and includes a list manager so you can host your own mailing lists.

So far I've installed Post.Office in five different locations and have yet to hear a negative word. If you want to give it a try from the user's point of view let me know and I'll be happy to create an account at one of our sites for you to try.

Bill Curnow, Holder of Past Knowledge
`bcurnow@onramp.net`
`http://www.kernow.com/bcurnow/`
`bcurnow@kernow.com`

Bill:

Thanks for the correction. Software.com will also be exhibiting at ISPCON in August. They're apparently making some headway with this NT mail product.

Jack Rickard

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ISPs THAT ALLOW SPAM

Mr. Rickard:

I almost was able to grab a copy of your ISP list the other day in a local bookstore, and I was wanting to check something. Does it specify which companies allow bulk email (spam) to occur? It seems that I've been chasing my tail trying traceroutes and domain enquiries just to find a provider that gives a damn about their name being dragged through the mud by these spammers.

If I had a list of the companies that let this happen, I'd know who to put on my hate list. Right now, I'm using Spam Hater, which has a good bit of usefulness. I use it to do domain enquiries, traceroutes, and send precomposed flames to spammers. It's pretty interesting. If you have any ideas, Jack, please give me a reply.

Sincerely,

Brian Clark
`bclark1@iAmerica.net`

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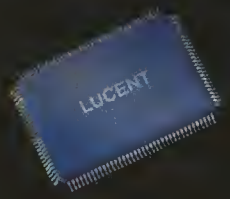

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Brian:

My immediate reaction is that I do hope you know that the current most pressing problem is spammers who reflect their mail off of innocent ISP SMTP mail forwarding machines. A lot of your flames are going to people who didn't spam you in the first place. As such, you're contributing to the problem. And I still can't imagine how anyone believes that replying with hate mail in quantity to someone that spews forth several hundred thousand (or more) messages per day accomplishes anything?

Finally, this is the heart of the Vixie switch and Paul Vixie's demonically moronic solution to spam — let's scapegoat the Internet service providers. His self-aggrandizing efforts only exacerbate the problem.

In short, I too find spam annoying as hell. But I'm beginning to find the anti-spamites equally as annoying. If you can't come up with a solution to the problem, at least be shrill and mindless about it?

We've looked at this problem for several years and I'm coming to the same conclusion that Bob Metcalfe came up with in about 40 seconds. Free e-mail is the problem. We cannot make ISPs the scapegoats or the little deputy censors for electronic mail. But something has to be done.

Jack Rickard

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Jack

We talked several times about a year ago about the Internet and I did a short piece for *The Christian Science Monitor* on your directory of ISPs. I'm off *Monitor* now and freelancing but mostly getting into writing a book - on journalism. I suspect there will be some material in it on the net. Not sure now just what. The net won't be the focus. Still, I'd like to stay in touch. We are both busy ... so not excessively! I like the independence of your outfit.

You folks did a special on the big guys like BBN. Are you still tracking the backbone providers? And how is BBN doing? Are they going to be a continuing power? Meanwhile, take care and enjoy Colorado. I have a brother and sister-in-law in Colorado Springs. Regards,

David Mutch
`dmutch@gis.net`

David:

The state of journalism is discouraging. It varies from gross incompetence to straggle legged whoredom in varying degrees. I quake at the prospect of doing a book on it. Please don't include me among my peers.

BBN Planet is an interesting case. They are the stepping stone of the Internet. AOL and AT&T both use them prolifically on the way to developing something substantial of their own. They by rights should own the entire thing. They don't. I guess they will wind up being the Bill Godabout of the Internet. GTE bid to buy them out last week.

Colorado is lovely. I'm thinking of relocating my entire operation to a 150 year-old seminary in Missouri. But I do like the mountains.

Yours;

Jack Rickard

◆◆◆

MEDIA HYPE...WHAT A WONDERFUL THING

Dear Jack

For the last few months I have been sitting back and listening and watching the media hype over 56k technology. What a thing advertising can do.

First of all, I have been in the online service sector for 4 years. Starting with my Bulletin Board Service and then expanding it to a full Internet Service Provider service. So I am not new to all of this.

I saw all of the hype of 28800 come through a few years ago, and yes I got caught up into the media blitz, I bought a couple of Supra VFC modems.

Basically this letter is to people who are new to the online service.

My first word of warning is...X2 and Flex are NOT industry standard. Most likely in 6 months or so there will be a standardization in the 56k world.

When VFC first came out and that wasn't standard, anyone who has been in the business knows well enough, that if they purchased a VFC modem when it was first released it ended up costing more money to upgrade to the V34 standard when it was released.

Right now all of the 56k vendors are HOPING that their technology does end up being the standard and the ISP's and SYSOP's who is socking out 10's of thousands of dollars are hoping so too.

Here is my stand on the subject. I would rather wait until there is a standard before upgrading and wait for the "overpriced" technology to come down a bit in a price, maybe a few thousand dollars would be nice!

Even if the price doesn't come down, why purchase something now that is not standard in the industry and paying more to upgrade to it in 6 months.

Now for my second word on this. If people that are in a remote area and their phone company hasn't kept up with the facilities, the 56k is not going to work. Most people here have a hard enough time getting 28800 connects, let alone 33.6. Also most people, if they have a decent modem can get 4-6k downloads of off the net with a 33.6 modem anyway if they set their baud rate to 115200.

Just my thoughts on the subject and thanks for your time. I will now go watch the Sally Ride on the US Robotics commercial. :-)

Don Bindley, President
FireBurners BBS Online, Inc.
North American Registration Site For Arrowbridge
`http://www.fbo.com`

Don:

How'd you get in this business? To expand your theme, there's nothing you can do with that computer that I can't do with a pencil and paper. What do I need one for? Besides, I can do that in my head.

Ludditism is its own reward.

Jack Rickard

◆◆◆

CommPlete™ Satisfaction.

Get the CommPlete K56flex upgradeable server solution for ISPs and enterprise LANs.

Introducing something so advanced, so fast and so functional, we had to call it CommPlete.™ The new Multi-Tech CommPlete Communications Server is the single solution you've been asking for.

CommPlete versatility. Now you can combine dial-in/dial-out operation with digital channelized T1 and ISDN PRI WAN access in one system that connects up to 96 remote users per rack to ethernet IP or IPX networks. Based on Lucent Technologies Microelectronics Group K56flex chipset, this solution offers compatibility with a wide range of client modems.

CommPlete flexibility. Each of the four remote access servers can be independently configured using either our RASExpress, WindowsNT™ RAS or Novell® Netware Connect. Mix and match servers as needed for your operating environment.

CommPlete control. CommPlete offers platform-independent management from anyplace in the world using SNMP, Web pages (HTTP), Telnet or our Windows®-based management software accessed over any TCP/IP network via the attached ethernet.

CommPlete power. Each T1 WAN link has its own Pentium® processor, designed for optimum throughput, even when every port is busy performing large FTPs and graphic-laden Web pages at 56K or ISDN speeds.

CommPlete reliability. Multi-Tech's reputation for quality and reliability goes back 26 years. In addition to ISP and intranet servers, Multi-Tech's family of products includes LAN access solutions, client modems, multi-user access products and WAN technologies.

Get the CommPlete story, as well as information on all of our products, by calling Multi-Tech at **(888) 288-4312** or contact us on the Internet at **http://www.multitech.com**

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2205 Woodale Drive / Mounds View, Minnesota 55112 U.S.A.
Tel: (612) 785-3500 / Fax: (612) 785-9874 / BBS: (612) 785-3702
www.multitech.com

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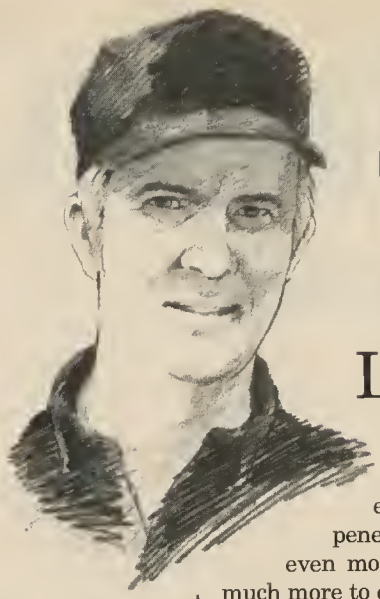
56K™



TECHNOLOGY FRONT

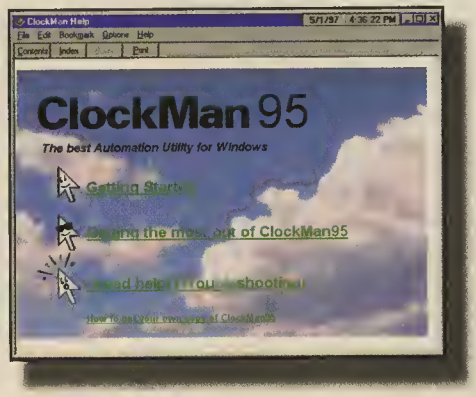
by Jim Thompson
Western News Service

WATCHING OVER YOUR SYSTEM WITH CLOCKMAN95

Jim Thompson is Managing Editor of Western News Service in Los Angeles, California. CompuServe: **72777,2677**, MCI Mail: **321-4127**, **mailto: jim.thompson @wnsnews.com**

Life is complicated and gets more so every day. When computers first came on the scene they held the promise of making life simpler. I am talking here about the ancient days of the computer — way back in the 1980s. What happened is that the computer allowed us to do even more things with the result that there is much more to do and many more tasks to track.

While we will probably never be able to return to the simpler days of the past, there is something we can do about keeping track of the everyday activities that tug and nag at us thanks to a neat little utility program called *ClockMan95* from Graphical Dynamics, Inc.



ClockMan95 is an intelligent alarm clock for Windows that can automate virtually any computer task. This could include automating backups, sending and/or retrieving e-mail from the Internet or other online services, optimizing a local hard drive, scanning for viruses, even automating mainframe data downloads. It also includes a host of alarms and reminder messages that will nag you to keep on schedule.

MULTIPLE MESSAGES

There are five message types. The *announce* message displays a large message box that contains the text you wish, the *confirm* message precedes any event you have associated with an alarm allowing you to confirm that you want the event to run. The countdown message starts a *countdown* timer and launches an associated event when it reaches zero. The *invisible* message launches an event or program without asking for permission or issuing a warning. Finally, the *TimeSquare* message displays a scrolling message in the title bar of the active window.

ClockMan is as simple to install and setup as it is to use. Simple menus guide you through the process of setting alarms, reminders and automated processes. Speaking of automated, one of the best features of ClockMan95 is something called *Automation Assistants*. Using the familiar "wizards" format, they allow you to automate complex tasks within specific programs using ClockMan95's powerful WIL programming language.

Currently, the programs encompassed by the automation assistants are limited, but Graphical Dynamics says more will be added. The list includes Netscape Mail, Pegasus Mail, Eudora, Microsoft Exchange Client, Norton Utilities for Windows95, McAfee's VirusScan (both NT and 95 versions), Norton AntiVirus, OzCis & OzWin, TAPCIS (version 5 and the new 6), NavCIS, Norton Speedisk, Norton Disk Doctor, Windows95 Defrag and Windows95 ScanDisk.

CUTTING OUT THE SPAM

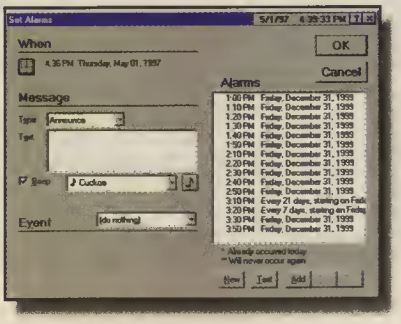
One of the neatest utilities is called *AntiSpam* which will nuke Unsolicited Commercial E-mail (UCE, aka "spam") from your POP3 mail automatically.

You set this up through a wizard which clarifies what you consider to be spam. The first wizard dialogue box asks you to enter or select phrases or words that might indicate spam if they are contained in the subject line or message body. Next you can select from a list of "well known" spam domain names. Of course, you can also add any of your own. You can also filter out messages that use "blind CCing" to hide the recipient's addresses from each other. If you do want to receive messages from certain addresses which may fall into one of the above categories, you can tell the program to deliver messages from specified locations. The result is a fairly sophisticated filter that should zap all the unwanted spam from your plate.

According to Koll Simonds of Graphical Dynamics, Inc., the anti-spam feature was actually inspired by our guru and resident analyst, Jack Rickard. The idea came after reading the December 1996 issue of ***Boardwatch,*** which featured an expose and explanation of spam.

ClockMan95 accomplishes its magic via the Windows Interface Language or WIL. This powerful language contains more than 400 functions allowing you to do just about anything you want within a Windows program or the Windows environment. This can include running Windows and DOS programs, sending keystrokes directly to Windows and DOS applications, rearranging, re-sizing, hiding, and closing windows, displaying information to the user in various formats, prompting for any needed input, copying, moving, deleting, and renaming files and copying text to and from the clipboard. The possibilities are virtually unlimited. Best of all, WIL is extremely easy to learn.

If you can write a batch file, you can work with WIL.



Graphical Dynamics, Inc. even offers an Automation Assistant Development Kit (AADK) allowing you to write your own automation assistant wizards. These can be written in C/C++ or with WIL.

ClockMan95 is a terrific program that will automate repetitive tasks and help you get organized. It might even simplify your life.

CONTACTS

ClockMan95
Graphical Dynamics Inc.
2701 California Avenue SW
Suite 301
Seattle, Washington 98116
Tel: (800) 779-1799 or (206) 935-6032
BBS: (206)938-2398
WEB: www.graphicaldynamics.com.

PRICE: **$79.95**
Requires: Microsoft Windows 95, or Windows NT 3.51 or later. ◆

GTE TO ACQUIRE BBN

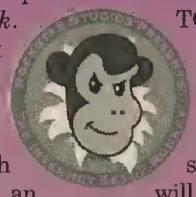
The GTE Corporation has agreed to acquire the BBN Corporation in a deal worth approximately **$616 million**. BBN is an Internet pioneer who helped develop advanced data transmission technologies. GTE will commence a cash tender offer to acquire all outstanding shares of BBN common stock for **$29 per share**, roughly a 28 percent premium over BBN's closing price on May 5th, the day the deal was announced. The deal still must be approved by both company's stockholders.

As a part of the deal, GTE said it would boost its capital spending by a minimum of **$2 billion** over the next four years. GTE's purchase of BBN should position it as a major Internet player, and put GTE in the fore front if and when voice traffic moves to the Internet's high-speed data network. GTE may now compete with AT&T, MCI, and WorldCom for broad-based networking services, including voice and high-speed data transmission. ◆

Internet Setup Monkey Specializes in Mac Clients

by Steve Clark

The Mac ain't dead yet. But with its limited market share, Mac support is relatively low especially when you consider that an entire industry of computer jockeys has emerged who specialize in making Windows *work*. Many ISPs, using UNIX, Linux or NT, have limited Mac support. Some ISPs like MacConnect (www.macconnect.com) serve only Macintosh clients and have experienced an increase in business since posting a special offer to Apple's "Evangelist" (www.evangelist.macaddict.com) –a listserv maintained by Mac advocate Guy Kawasaki. Some ISPs advertise themselves as "Mac Friendly," meaning that they have some Mac software and documentation.

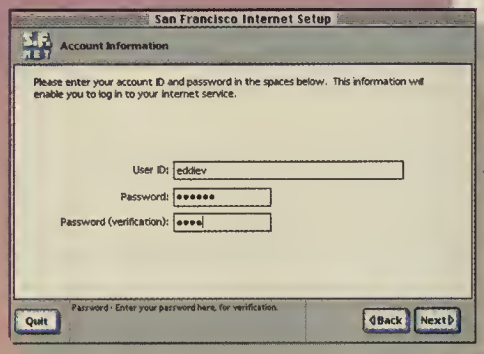


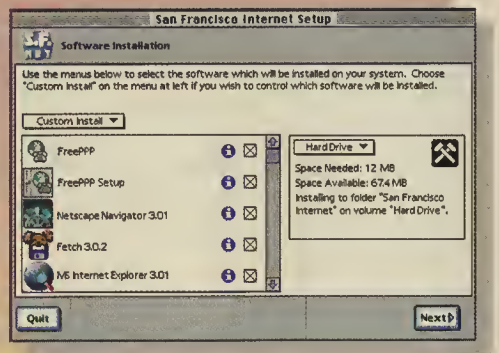
Since the level of Mac client support is pretty low among ISPs, a great product has emerged that allows ISPs to confidently support Macintosh subscribers. The Internet Setup Monkey Admin Kit by Rockstar Studios (www.rockstar.com) is a do-it-yourself kit that ISPs can use to create installation disks for Mac clients. "The Monkey" Administration Kit runs on any Macintosh with a 68020 or greater chip, and on all Power PC Macs and Mac clones. At minimum, an ISP can buy a used Mac for **$300** and Rockstar's Administration Kit for another **$300** and be up and running as a Mac-friendly provider. Rockstar also offers 20 hours of absolutely free technical support with each license.

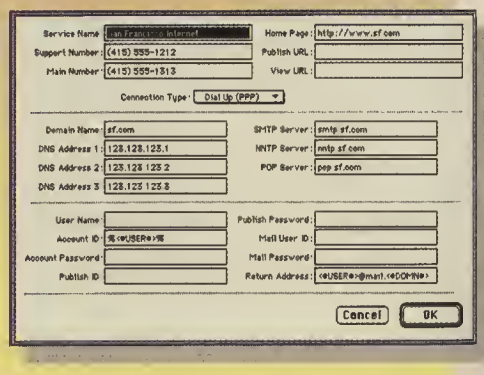
The Monkey will install and configure such software as FreePPP, MacTCP, Open Transport, Netscape Navigator and Navigator Gold, Internet Explorer, Eudora and Eudora Light, John Norstadt's Newswatcher, and Internet Config. New applications are constantly being added. With it, the ISP can create a fully-customizable installation process. Customers can pick and choose the software that they need or want.

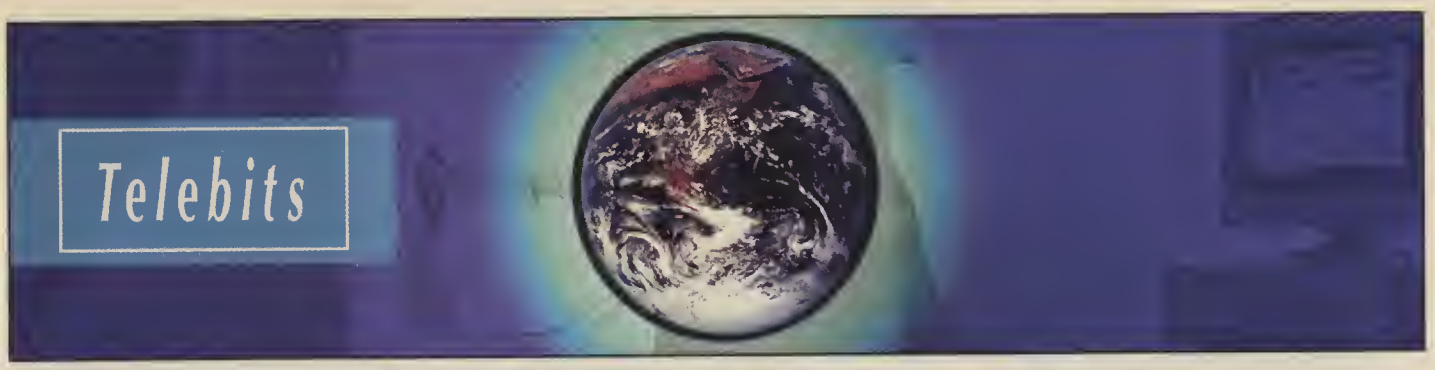
Recent versions of the Macintosh operating system have sported not-so-minor changes with respect to Internet connections. Within System 7.5.x, there are options which include MacTCP, PPP, Open Transport and all sorts of third party software like FreePPP, MacPPP, and the Internet Valet. System 7.6 has replaced MacTCP with another control panel simply called TCP. Even devoted Mac users have difficulty keeping up with which revs of which version has what. And still nobody knows what NeXT will bring!

Rockstar has created a niche by specializing in a more or less neglected demographic. ◆









LIVINGSTON LEASING PROGRAM EXPANDED

In January 1997, Livingston introduced its Access Leasing Program, designed to enable ISPs to expand their operations while minimizing capital costs. Since then, over 100 service providers in the United States have acquired PortMaster remote access servers through the program. In April, Livingston announced that the program would be expanded to Canadian ISPs as well.

Through this program, Internet service providers can increase their capacity for as little as **$13** per month per port. Local loop charges, of course, are not included.

Participation in the Livingston Access Leasing Program starts with filling out a credit application. A .pdf version of the credit application is available at `www.livingston.com/Marketing/Press/LEASEAPP.PDF`. It can also be obtained by calling Livingston Capital at **(510)737-2233** or **(800)458-9966 ext. 2233**, or through e-mail (`leasing@livingston.com`).

More information on the program is at `www.livingston.com/Marketing/Products/pm_leasing_data.shtml`.

MUSTANG WIN SERVER

Mustang Software has introduced Wildcat Interactive Net (WIN) Server, a multifunctional Internet/intranet server. The WIN Server is an all-in-one application with web, ftp, e-mail, and dial-up remote access functions. Other features include: forum-style messaging; file search, transfer and virus-scan; teleconferencing, electronic commerce design; and CGI support.

The WIN Server is available in three different editions: Community, Business, and Enterprise. The Community Edition supports two concurrent callers and costs **$99**. The Business Edition supports 16 connections and has report-generation functions. It costs **$1,125**, including one-year toll-free support. The Enterprise Edition can support 64 connections and costs **$2,995**. It includes an intranet application development environment and Usenet configuration.

The WIN Server is available through retail stores and mail order. A free "Personal Edition" is available for evaluation from Mustang's web site at `www.mustang.com`.

US ROBOTICS EXPANDS LANLINKER LINE

This fall, US Robotics will add another model to its new line of products for small businesses and home offices. The current LANLinkers are for digital 56K and ISDN connections. This new model, the LANLinker Dual Analog, will have two 56 Kbps x2 modems that can either connect to two separate dial-up networks at 56K or to one network at 112 Kpbs. The user only needs to have 2 analog telephone lines.

The company debuted the modem at NetWorld Interop.

Like the LANLinker 56 and the LANLinker BRI, the Dual Analog is a low-end router designed for easy connections. It supports IP, IPX, AppleTalk and LAN-to-LAN routing.

Pricing has yet to be determined, but US Robotics says that the LANLinker Dual Analog will be less expensive than the LANLinker BRI, which lists for **$795**. Inquiries may be directed to **(800) USR-CORP**.

PANASONIC EGGCAM

Panasonic Computer Peripheral Company has created a computer camera with an appropriate name. The EggCam can produce high-resolution, 24-bit color images. It has a swiveling, tilting base and sits on top of any computer monitor

The EggCam also has an omni-directional microphone for audio and automatic gain controls to compensate for lighting. It works well with a 28.8 Kbps modem, better with higher speeds, and is bundled with CU-SeeMe for **$199**. The EggCam is available through most retailers and mail-order houses.

AOL4FREE IS A TROJAN HORSE

A file called AOL4FREE.COM has been floating around the Net. But it has nothing to do with America Online nor does it give anything for free. Rather it's a Trojan Horse. When exe-

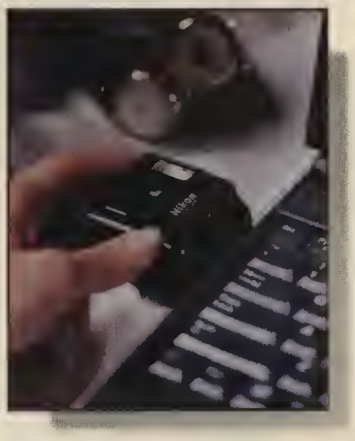
cuted, it wipes out DOS-formatted hard-drives. Victims can salvage some of their systems if they press the Ctrl-C keys. So, do not download AOL4FREE.COM. If you see it on someone's computer, do not double-click on it. Delete it immediately.

THE COMPUNET 2000

Integrated Technology (`www.iti2000.com`) has introduced its second generation PC Keyboard and Internet telephone all in one. The CompuNet 2000 can be used with Internet telephone software. It uses the number pad to control telephone functions like volume, redial, and mute. The number pad is also reversed for the telephone functions, so it resembles a telephone more than a computer. (7 on a telephone phone number pad is 1 on a keyboard...)

The CompuNet 2000 costs **$239.95** and is available through most retailers and mail-order houses.

COMPACT DIGITAL CAMERA ON A PC CARD



The Nikon Coolpix 100 is a small digital camera designed for mobile professionals. It connects to a PCMCIA card and is available at major retailers and through mail-order. It costs **$499**.

Nikon (`www.nikonusa.com`), a leading maker of film-based cameras, can be reached at **1-800-52-NIKON** (**526-4566**).

PROGRAM ALLOWS USERS TO SWITCH PROVIDERS ONLINE

Hurlnet has developed a new software program that ISPs can put on their web sites that will allow users to switch providers while online. Several ISPs already allow for new customers to sign up using a form on their web sites, but the Hurlnet program takes it one step further.

The software is called *ISP Register* and it is a server package that runs on Windows95, Windows 3.1, and Macintosh. It can display pricing options to a potential customer, allow the customer to choose, and create an account. The software even verifies the customer's credit card.

The only thing that ISP Register doesn't do is cancel the customer's old account. Prices for ISP Register range from **$1,500** for a 10,000 user license to **$4,500** for an unlimited user license. It can be purchased or demonstrated online at `www.hurl.net`.

APC SYMMETRA POWER ARRAY

APC has begun taking orders for the Symmetra, its new uninteruptible power supply which will be shipping this fall. This hot-swappable unit is expandable, so it will allow ISPs and network administrators to painlessly grow their capacity. The Symmetra is a fully-redundant power supply that offers "the highest level of power protection in its size," according to APC. It can also be equipped with additional battery modules.

The Symmetra is self-diagnosing and can be managed through a remote PC or the Web.

Prices start at **$8,499**. More information is available and preorders can be done by calling APC at **1-800-800-4272**.

STARNINE RELEASES WEBCOLLAGE

StarNine Technologies, Inc., has released WebCollage, a brilliant graphic tool for web designers. WebCollage is a gif development environment that goes out on to the Web and updates images on a dynamic basis. The program allows for the images and the text of images on web site graphics to be automatically updated. The program is fully scriptable.

There is an introductory price of **$199** through June 30, 1997, after which time WebCollage will cost **$249**. Each copy includes manuals, tutorials, templates, and 90-day free technical support. WebCollage comes with a full 30-day money-back guarantee.

The product can be downloaded for evaluation or purchase at `www.starnine.com/webcollage/webcollage.html`. StarNine can be reached by phone at **1-800-525-2580**.

IRIDIUM LLC LAUNCHES FIVE SATELLITES

Iridium LLC, a consortium of international telecommunication firms, launched five new satellites into orbit on May 5. These were the first five satellites of what will be a 66-satellite "constellation" network for all types of communication—voice, fax, paging, and data. The network, which is expected to be up and running by late 1998, will leave no part of the earth untouched. It will allow communications of all types to reach anywhere on the planet.

Iridium LLC is composed of major players such as Motorola, Lockheed Martin, Nippon, Sprint, Pacific Electric Wire & Cable, Raytheon, Thai Satellite Telecommunications, and other Iridium affiliates worldwide. ◆

BABB'S BOOKMARKS by Chris Babb

MEDIC!

Chris Babb is a Senior Systems Engineer for Control Masters, Inc., a Systems Integrator located in Downers Grove, IL, where he designs industrial automation software by day. He's a member of the Aquila BBS/Internet Team by night. Chris has worked with Aquila since 1990 and currently handles technical support, web design and construction, Internet training and various other online and offline duties. In his meager spare time, Chris enjoys music, playing bass guitar, the outdoors and his kitties. You can reach Chris via **mailto:**`chris.babb@aquila.com`

Much has been said and written about all of the great software that has been released for use with the Internet over the last 3 years. Browsers, Internet phones, web development tools, graphics packages, news readers, e-mail programs and countless other neat and interesting programs have cluttered our hard drives and at times, have made us want to pull our hair out (in numerous, painful ways) in the determination to make them work. When it comes down to it, if there isn't any new, life enhancing software released each week, I get truly bummed.

What I find interesting though, is the utter lack of useful, user friendly (and did I mention, inexpensive?) Internet diagnostic tools. Since I've been using the Internet, the only real programs that have been freely available are the old standbys like Ping, Traceroute (or hopcheck), WhoIs and NSLookup. Win95 gave us some of the same tools, in a DOS window. Fortunately, all of that has finally changed and an excellent tool for both end users and ISPs has emerged called ***Net.Medic***.

As I was browsing through the endless stack of information that clutters my inbox, I came across a press release for Net.Medic (VitalSigns, Inc. `www.vitalsigns.com`). Net.Medic, at its most basic level, is an Internet diagnostic tool, designed for ISPs and end users alike. It works in conjunction with your current browser and displays a wide range of statistics and information about your current connection to the Internet. These statistics can help you isolate, diagnose and correct some of the real problems that all users face everyday.

One way to help you realize how useful this product is, is to relate some all too familiar conversations with users and to talk about a problem that I discussed in the September '96 issue of ***Boardwatch***.

One of the biggest hurdles to get over when providing technical support to customers is to help them understand the distributed nature of the Internet. Just because a user can't get to the Gag-2-Day web site doesn't mean that the ISP is having a problem. The problem could be in any number of places from the ISP's provider to the web server, and unfortunately, the ISP has little control over them or anything in-between. But, as many ISPs have found, it doesn't really matter where the problem is as they tend to have the blame heaped upon them anyway.

I can remember a situation where one of our users couldn't get to his favorite site through our service. The question I received went something like this, "I can't get to yada.yada.yada.com through your service but I can get to it through another ISP. This must mean that your service is currently broken and if you don't fix it, I'm going to another ISP." Well, at the time, I only had the most rudimentary tools available to me and after looking at the situation, I found that one of SprintLink's routers was down on the East Coast. I explained the situation to our user and the response was basically, "Yeah...right." So, being one that likes to prove my point, I did a Traceroute to yada.yada.yada.com through our service, and then did one through the other ISP that he mentioned. As I thought, the other ISP was using a provider other than SprintLink and was taking a different route to this site. Only after hand typing the Traceroute information into an e-mail message (the program offered no ability to capture this information to the clipboard) was the problem actually made clear and was accepted by our user.

As far as slow web sites go, nothing has changed since September other than more of the eternal wait at some of the more interesting (but under-powered) web sites that unexpectedly become the hot spot of the month.

In light of the above sprinkles of cheer, I think you can understand the need for a tool that helps the ISP and the user to gain an insight to the workings of the Internet. The ISP needs an inexpensive way to help tune its system for customer response at the network level and an informative tool for the help desk. For the end user, something is needed to help visualize the convoluted paths that IP packets travel and to show what is *really* slowing things down and why that page

doesn't come up. With the flood of code words and acronyms flying around, I suggest we coin a new one for indispensable and affordable Internet diagnostic tools — Net.Medic.

Let's talk about what Net.Medic has to offer:

VISUAL FEEDBACK

Almost everything you need to know about your connection to the Internet and the path to the web site you are trying to view is here. It's high-tech looking, informative and very cool. This information is displayed in panes on what is called the dashboard. One very cool aspect of the program is the ability to pop these panes off the dashboard and either float them on your desktop or embed them into your browser.

The **Ticker Tape** will instantly let you know the site you are connected to, current network stats and the last problem that was detected. Another interesting feature is the ability for a network administrator to embed information within the tape to alert his users of impending downtime or other information.

A visual representation of your connection is displayed in the **Activity Pane**. Your computer, your modem, the routers that are passing through and finally the web server itself is shown here. All are color-coded either gray, denoting a healthy state, yellow for moderate health or red for poor health to help you see what is really happening and where.

Information **Throughput** is shown as a graph of data sent and received over time. This is actually the most informative piece of information shown as it lets you know if data is being transmitted or received and also shows if your full bandwidth is being utilized. No more staring at the modem lights, gazing at the network hubs or just wondering what is going on.

Retrieval information is another useful statistic which shows the total time spend waiting for a page, the average data transfer rate and 2 bar graphs showing whether delays are on the network or site end of things.

The **Client** pane will show you for better or worse, how your computer is performing. Green, yellow and red indicators will alert you to potential problems with your setup, a bar graph and percentage of CPU load let you know if your overworking your computer.

Your **Modem**, being the lifeline to the Internet, is given appropriate space to let you know exactly how it's doing via indicator lights, a moving pointer showing the current compression levels and an indication of your connection speed verses the maximum connect speed for your modem.

If you forgo using a modem to connect to the Internet, you'd see the **Intranet** pane. Connection health, network delays and a traffic percentage graph are shown here.

Does your provider suck? If so, the **ISP** pane will uncloak the mystery behind an inexpensive provider who provides more than it should. Information shown here includes the ISP health, estimated network delays caused by your ISP and a graph of traffic congestion in your current path to a web site. I must make special mention here that this value is the ISP delay time compared against a historical distribution of ISP delay times. This number is baselined over time and will become more accurate as it monitors your connection.

Since you usually travel over the Internet to get to most of your sites, **Internet** delay and traffic information needs to be looked at. Here, you'll see another delay chart and traffic bar graph along with a peek speed indication. Keep in mind the special mentions made above as they still apply here.

The **Server** pane is where you get to find out how overloaded most of the web servers out there really are. Here, you will find a delay chart, a server load bar graph and a throughput meter. Once again, keep in mind the special mentions made above and the fact that the server load is baselined over a period of time.

Finally, there is the **Modem/Session Time** pane. Here is where you get to see how much time you spend during this session, all of today and all of this month. This pane switches between session and modem connection time depending on how you are connected to the Internet

LOGS

As if the above information isn't enough, still to describe are the logs. Icons at the top of the Net.Medic window allow you access to a wide variety of statistical information contained in the logs. There are a bunch of things to look at here and I'll touch on a few of the important ones:

The **Session Summary** is a quick way to get an overview of everything that's happening with your session. Here you will find a pie chart that shows performance degradation based on a combination of the client, modem, intranet, ISP, Internet and web servers. You can also get a view of the above listed in a minimum, maximum and average format.

The **Call Log** is useful for modem users and it shows the session start time, connection speed, call duration, throughput and idle time.

A **Frequently Visited Sites** report gives you a bar chart overview of the number of times you have visited a site and the delays and speeds associated with them, again shown with minimum, maximum and average values.

The most important of the logs is the **Health Log**. Here is where you'll find a list of everything that Net.Medic finds to be a problem listed in a where, what, when and who layout. Typically, you'll find that any time you have a status light that goes yellow or red, it will be logged in this report. From here, you can click on diagnosis to get a more detailed explanation of the problem and some suggestions on what to do about it. Once in the diagnosis window, you potentially have up to 3 options. **Autocure**, will fix some of the more basic problems like port speed. **Notify** allows you to send off a message to the offending party. This is a key feature in Net.Medic as it can help your ISP determine if something needs fixing. I'm sure it will also be the most controversial part of the program once it's in the mainstream.

REPORTS

OK, one last list of things. As if all the above wasn't enough to satisfy a true information junky (and what Internet user isn't?), there is a slew of reports available to further prove any points you have and generally make your Internet life just a tad more interesting.

The **Health Summary Report** combines a month's worth of the same type of information as you see in the session summary with the addition of a bar chart showing the 5 top problems you have been experiencing.

The **Service Provider Report** gives you all of the information to reinforce your opinion of your ISP or decide that it's time to find a new one. **Call Availability** is a summary of busy signals, no answers and other connection errors experienced. **Activity** is an aggregate of the number of calls, connection rate and time, bytes sent and received, maximum, minimum and average speeds and traffic maximums and averages. Two bar charts show your service usage, graphed over time of day and a service failure report that lists a total of failures, again graphed over time of day.

Of the most useful reports, the **Traffic Report**, is one that should be accessed often. This shows the average traffic detected on the ISP, intranet and Internet, graphed over the time of day. Very useful in determining the least busy times to jump on the Internet.

Rounding things off are reports for the slowest sites and frequently visited sites.

So...that's the poop on the program. Sounds nifty, eh? Well, I agree with you on that one. From my conversations with VitalSigns Vice President James Goetz, I say that the overall response to Net.Medic was excellent from both ISPs and end users alike.

I had several conversations with Jim Goetz and I was told that with the successful unveiling of Net.Medic, we can expect to see several new tools in the future. These tools will be geared toward ISPs and IT professionals and will help them to better understand what their users are seeing. After seeing **Net.Medic** and it's potential, I can't wait to see what they come up with next.

Now, as you can tell from the tone of this article, I love this program and what it represents. Unfortunately, with the unveiling of this product and it's ability to show an end user what is really going on, I almost feel as though a can of worms is about to be opened.

First off, I'm afraid that some users will take a glancing look at what they are being shown and without regard to traffic and usage patterns, will immediately dump their ISPs if they see a high traffic percentage or delay. All I can say to this is to remember that initially, this data will not be reflecting totally accurate information. I would allow several weeks or more to go by for Net.Medic to accumulate data before taking a close look at the information to make this determination.

Second, I'm afraid that a program like Net.Medic may scare a few ISPs for the reason mentioned above. Naturally, if an ISP has dropped 300 modems on a T-1, then they should be scared. They are shortchanging their customers and should be called on it. I have no sympathy for them. But, an ISP who is providing the customer proper bandwidth should welcome an inexpensive product that helps them to provide the best service that they can while helping their customers understand the "behind-the-scenes" of the Internet.

I suppose the first question from and ISP should be, "Why should I believe that an inexpensive product like **Net.Medic** will provide accurate information?" Fair question. VitalSigns is not just 2-guys software. The engineering staff of VitalSigns Software was drawn from some of the top names in the industry such as HP, Microsoft, Cisco, SynOptics, Lotus and Sonet. All with experience in network engineering and diagnostics. The software was tested in a wide variety of different configurations and gets "dangerously accurate and more and more powerful" as the program is used. I was also assured that if Net.Medic errs, it errs on the side of the ISP. A comforting thought for me.

The next question/concern I believe would be, "All we need is a million people running a program that throws more packets out on the network. Is that what Net.Medic does?" Actually, the program itself draws most of its information passively from information already contained in IP packets. In fact, over 70 percent of the information on the dashboard is gathered this way. (I was assured that VitalSigns is very sensitive to traffic concerns as any Internet developer should be.) Upon initial startup of the program, 6 to 12 "discovery" packets are sent out to gather information from the ISP and the status of your connection. At that point, all monitoring is passive until a problem is detected, which is the only other time that any activity takes place. Even then, only 1 to 5 packets is required to determine what problem is being faced.

The final question that should be asked is what browsers does it work with? By the time you're reading this, Net.Medic will work with IE3 & 4 and Netscape 3 & 4. Hopefully, in the future, we can talk VitalSigns into a version that works with all aspects of the Internet from browsers to e-mail to news readers and everything else we all love to use to suck information from the Internet.

For more information on VitalSigns, Net.Medic and anything new that comes from them, be sure to visit their web site at `www.vitalsigns.com` where you will also find an excellent white paper on the problems we all face as Internet providers and users.

Regardless of everyone's initial feelings, I expect VitalSigns to flourish and Net.Medic to become as useful and necessary as your current flavor of browser. It already lives on all of my computers, put it on yours.

Unless something new and exciting happens that blows me away and forces me to write a dissertation on the subject, you can expect to see the normal Babb's Bookmarks format return next month.

I'm always interested in reading what you have to say and am always willing to take a look at a site... any site you think is interesting, useful or just downright strange. Let me know about them at `cbabb@aquila.com`. ◆

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LINUX REDUX by Alan Cox

LINUX EXPO

Alan Cox is the Technical Director of CymruNet, a leading Internet service provider in Wales, United Kingdom. Cox is also a member of the Linux International Technical Board and the CERT Vendor contact for Linux. He maintains the ***http://www.uk.linux.org*** *web page and leads the Linux Networking Project, the project to port UNIX to shared memory multiprocessor architectures, and a project to port Linux to 8086 embedded controller systems. Send e-mail to* **alan@cymru.net**

Linux Expo gave me the chance to sample the North Carolina sunshine (a welcome break from Wales which for all its good points has two main types of weather—rain and "about to rain"). The event was a great success although it wasn't without some glitches—the food was overpriced and there was no coffee. Yes, they had a Linux conference without coffee. I'm assured by the organizers that it wasn't their fault and there will be coffee next year.

The event was a good chance to meet many of the major Linux hackers, including quite a few people I'd not met before, and to renew old acquaintances. Unlike most conferences, people who didn't pay the fee to be in the auditorium got to watch it on TV screens for free, so students and those without sufficiently large expense accounts could still get the benefits of the event.

I was surprised at the lack of news breaking announcements at the Expo, although there were several new products on show, such as the 4.3 release of Applixware and the Caldera OpenLinux system. Red Hat was beta testing its next release at the Linux Installfest, as well as giving Olaf Kirch a chance to really beat up his new kernel based NFS daemon—which it turns out is very, very fast indeed. The kernel NFS daemon was clocking a peak of 5 Mbps reading over 100baseT networks—great news for all those wishing Linux NFS was that bit faster.

The Linux Bowl at the end of the conference was a great success and wonderful fun, even if the odd question did favor some of the contestants more than others. In particular, the question, "Who added job control to Linux" got the response, "Me" from Ted T'so.

It was a great conference. I will be back next year, if only to get revenge on Erik Troan's cat for waking me up at 4 a.m. Let's hope there is caffeine available next time.

X WINDOWS PROGRAMMING

With all the programs now coming out for Linux, there has been a noticeable shortage of graphical tools. There are various obvious reasons for this—without a doubt it is harder to write a GUI application. Another reason has been Xwindows itself. The Xwindows environment is probably neither a better nor worse programming environment to master than win32, except in the area of documentation. I've yet to find a good introductory book on Xwindows programming. The technical documentation is superb, it's just that being hit in the face by eight volumes of small-print O'Reilly manuals isn't the greatest way to learn a new interface. Fortunately there has been some progress on this issue and there are now some slightly gentler ways to write Xwindows-based programs. Indeed I'm currently trying to write a PIM for my new toy—an IBM PC110. More on that later, however.

XLIB

The lowest level interface to the Xwindows environment is Xlib. It is a low level drawing interface with some concept of windows. Normal people don't program in Xlib except when they have to. In general, programs written in pure Xlib are written by the same kind of people who write hand-optimized assembler routines for SVGA graphics. That isn't to say they don't have their place, but unless you are writing the next Xquake, it's probably not what is needed.

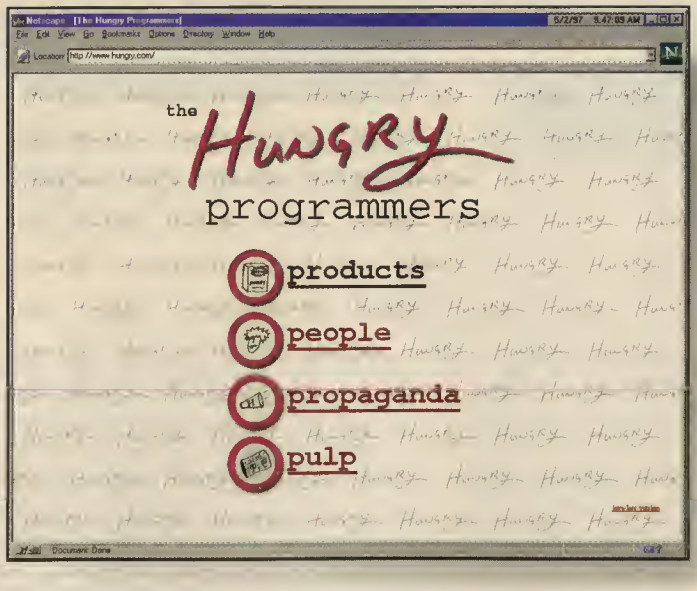
XT & XAW

Xt came with Xlib and it provides a framework for writing "widgets"—items of user interface that have convenient behavior and work in a friendly manner. Xt allows you to think in terms of buttons that are pressed instead of drawing lines and rectangles to draw buttons. Xt itself isn't directly useful to most people, but came with a reference widget set called *Xaw*, the "Athena Widget" set. Applications that use the Athena Widgets include programs like Xcalc. The Athena Widgets are free, unfortunately they are also ugly and quite limited.

Programming in Xaw has the same steep learning curve that I talked about earlier. To program in Xaw usefully, you need to know bits of Xlib, most of Xt and all of Xaw. Thus even though it is possible to fix the widgets to look pretty, as is done quite well by the Xaw3d widgets which look like Motif and the neXtaw widgets which look vaguely like NextStep, it is still a fairly rough way to write applications.

MOTIF

Motif was one of two contenders for the commercial Xwindows interface toolkit. It looks a lot like OS/2 and Windows 95, and comes very much from the same style of interface design. In the same way as Athena Widgets are built on Xt, so are the Motif ones. This makes Motif an equally difficult programming environment. To make it even more fun, Motif isn't free. Thus few Linux users have Motif and applications tend to be statically linked with Motif, making them larger and slower. As far as standards go however,



Motif is the standard. Many other widget sets look like Motif so you don't have to program in Motif.

As is always the case in the free software world, anything useful is worth cloning. A project called *LessTif* (`www.hungry.com`) has a quite useful Motif-compatible library. It won't yet work with everything but it does a very good job of many simpler Motif applications.

TCL/TK

Tcl/Tk is very different from the other programming environments. Tcl is an interpreted language designed to provide extensible user interfaces to C programs,. but it is frequently used standalone. The Tk widgets extend the Tcl language to include graphical primitives. Tcl/Tk provides a very fast way to prototype and generate simple Xwindows applications. Here is a simple example—a quit button

```
#!/usr/bin/wish -f
button .quit -label "Press To Quit" -command { destroy . }
pack .quit
```

As you can see, it's a relatively clean way to generate simple interfaces. Tk can also be used linked to the perl language (tkperl) and to the object oriented interpreted python language. For those people using Red Ha,t all the main Red Hat configuration tools are written this way and provide good examples of how to use these tools.

Trying to write large or complex Tcl/Tk applications is hard however, and interpreted performance is frequently slow. As an interpreted language, it does gain other advantages. On the whole a Tcl/Tk application will run unchanged on Linux or Windows, and now on the Macintosh.

There is a lot of useful Tcl/Tk information available at `http://sunscript.sun.com/tcttext.html`.

OpenLook

The loser in the battle with Motif, OpenLook had a very distinctive rounded style. OpenLook was championed by Sun and AT&T and two toolkits called *OLIT* and *XView* were pro-

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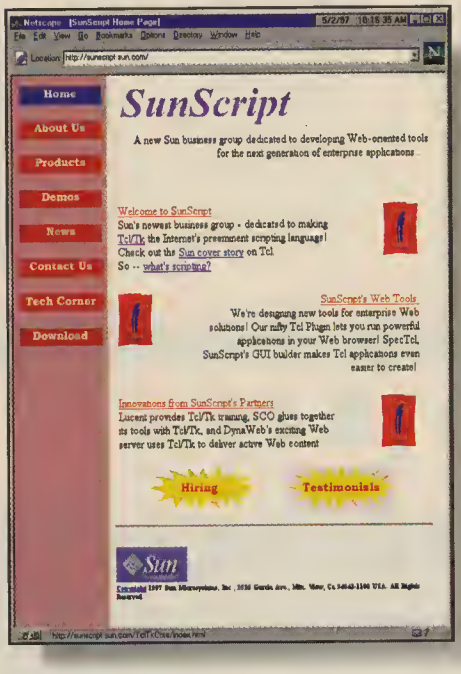
duced for it. OLIT was like Motif based on the Xt and Xlib programming metaphor with all its attendant learning difficulties. XView, however, was based on the SunView API from Sun's previous proprietary windowing environment. Sun even provided tools to automatically convert applications. The OpenLook interface had fans for two reasons: it looked nice, and the XView interface is very easy to program. Sun gave away all the sources to XView and it is thus available on most Linux platforms.

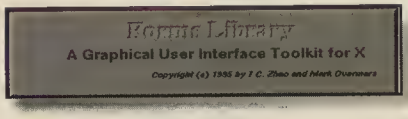


EZWGL

You are probably now delighted to think that you can either program X11 the really hard way or use an obsolete interface. Fortunately, EZWGL 1.2 was recently released. I've been following EZWGL for a while with some interest. It is a C library, it is easy to use and, as of version 1.2, it is powerful enough to write serious applications. The good news continues with the fact it is both free (`www.ma.utexas.edu/~mzou/EZWGL`), and under the GNU library public license. The clincher is the excellent 200 page user manual.

EZWGL conveniently looks like Motif, although you can tell the difference in odd places. For all these reasons, it is probably my current Xwindows API of choice. If you plan to do a lot of Xwindows work, then I'd still suggest you learn to program Motif as well. Motif is the one that you want on a resume.

XFORMS



XForms is provided free for non-commercial use as a set of binaries for many platforms. The actual XForms programming API isn't particularly easy to use, and it isn't too bad either. What makes XForms good for certain kinds of applications is its superb interface builder. This is a leap ahead of most of the other toolkits for that one reason alone. XForms is a great way to generate non-commercial Xwindows applications. You can download it from `bragg.phys.uwm.edu/xforms`.

WILLOWS

If you are trying to port a Windows application then Willows may be of interest. Willows (`www.willows.com`) is a commercial outfit that markets a Windows API for Xwindows. The idea is that you can take most Windows applications and compile them with the Willows toolkit. After a few tweaks, they will run under Xwindows on the many UNIX platforms. Willows don't exactly make this toolkit cheap but if the alternative is porting 100,000 lines of user interface code, then it's probably still a very good deal.

QT

Qt is an innovative multiplatform toolkit that provides mostly low level widgets and looks like Motif. It is C++ based and introduces some interesting message passing notions using things called *Slots*. Qt is free for certain kinds of software (for example free software) and is available from `www.troll.no` along with a sizable manual. Quite a few Qt-based free software programs are starting to appear now.

Oh and if I've missed your favorite toy or you want yet more options take a look at `www.smirod.no fsu/widgets.html`

for yet more possibilities. So perhaps we will finally see a wave of extra graphical applications for Linux. I certainly hope so.

EM86

Linux/Alpha users acquired the ability to run a huge range of Linux/i386 binaries with the release by Digital of EM86, an emulator based on parts of their award-winning FX32! technology. The current release is available for free from `ftp.digital.com/pub/DEC/Linux-Alpha/em86`. It has been demonstrated running major applications like Netscape, Applixware 4.2 and Acrobat Reader. Future versions will hopefully run far faster and include iBCS2 binary support (that is the ability to run things like SCO UNIX binaries).

PC110

I mentioned this wonderful little toy earlier. It's an IBM 486SL PC about the size of a VHS tape and a truly wonderfully well designed computer. I should have the machine up and running Linux in the next few days, and I'll cover the problems I find installing Linux on it (yes, they can run Linux) and on laptops in general next issue, as well as the features offered by the 2.0.30 and probably by the time it goes out 2.0.31 kernel releases. ◆

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CONSUMMATE WINSOCK APPS

by Forrest Stroud

THE BATTLE OF THE BROWSERS: ROUND 4

For now it appears that Netscape and Internet Explorer will be taking divergent paths with their respective 4.0 releases. With Communicator (Netscape 4.0), Netscape Communications Corporation is seeking to expand the role of Netscape by surrounding the core web browsing client with a group of critical communications components. The goal of Internet Explorer 4.0, on the other hand, is to integrate the web browser with your operating system so that your desktop and browser appear as one and the same. While it's perhaps still too early to tell what effect the two new releases will have on the web browser market, it would seem that the battle of the browsers that has raged since the release of IE 3.0 may well be dying down. The lull should only be temporary, however, when the first beta release of Netscape 5.0 (Constellation) becomes available, expect the battle to flare up with more intensity than ever before. For this month, let's take a look at what role Communicator will have on the browser scene. Next month, we'll do the same for Internet Explorer 4.0, and after that, hopefully we'll be able to take a sneak preview look at Netscape 5.0...

The applications reviewed here and many more are available on Stroud's Consummate Winsock Apps List, `www.stroud.com` and `cws.iworld.com`.

Forrest H. Stroud is a recent graduate of The University of Texas at Austin. The Information Systems and Data Communications Management major is currently working in College Station, Texas as a web developer for Mecklermedia Corporation. Stroud can be reached at `neuroses@tcac.com`.

Netscape Communicator

Desc:	The latest and greatest release of Netscape Navigator
Pros:	Impressive suite of Net apps, excellent control of the HTML language, Java, support for tons of plug-ins
Cons:	Lacks ActiveX support, multi-user needs improvement, the mail and news clients could be more intuitive
Location:	`ftp12.netscape.com/pub/communicator`
Filename:	n32e40??.exe
Status:	Free preview release. Shareware—**$59.95**
Company:	Netscape Communications Corporation
Web site:	`home.netscape.com`

Netscape Communicator is an interim release between Netscape Navigator and Netscape Constellation that will inevitably take Netscape Communications Corporation one step closer toward the goal of integrating the web browser and the desktop operating system. Like its counterpart release (Internet Explorer 4.0), Communicator is a fourth-generation browser that seeks to expand the role of the web browser. While Netscape Constellation will focus on integrating the web browser with your desktop, the Communicator release focuses on building critical communications capabilities around an improved web browser. The net suite that has emerged as a result is the most powerful of its kind. The five core applications of the suite are the *Navigator* web browser (4.0); *Composer*, an inline web editor that supersedes Navigator Gold; *Messenger*, an e-mail client; *Collabra*, a discussion groups/Usenet news reader; and *Conference*, an impressive real-time audio conferencing tool that counters Microsoft NetMeeting and supplants the CoolTalk client. A new floating toolbar similar to the one included with Microsoft Office allows you to quickly switch between the five applications. The toolbar can also be docked in the lower right-hand section of each application. Another new feature is Communicator's support for multiple users. While an important addition, this feature could stand to be improved by adding a default setting and user control via the options menu. The primary draw of Netscape has always been the web browser itself, and despite an intriguing handful of supporting applications, the web browser continues to warrant the most attention.

While the majority of changes in the web browser are more cosmetic in nature than revolutionary, there are quite a few new features that will appeal to Navigator fans. The most obvious changes have been made to the toolbars. First and foremost, the rather plain and dull icons of Navigator 3.x and earlier releases have been replaced with attractive 3D icons that put Internet Explorer's icons to shame. Additionally, there are three individual toolbars (including a cool new customizable personal toolbar), each of which are collapsible, meaning that the toolbar can be minimized to give the browser a larger viewing area. Another new feature is the ability to drag web links (as well as mail, FTP, and news links) into your bookmarks collection or onto your personal toolbar. The

back and forward icon buttons work as before with your left mouse button, but clicking on the icons with your right mouse button now allows you to choose a web page from your history listing. Additional cool new features include support for cascading style sheets, layering and absolute positioning, dynamic font support, global font size changes (one of Internet Explorer's early proprietary features), an enhanced kiosk mode, and improved OLE support. While internal support for ActiveX Controls is still missing, there are several third-party plug-ins available that will allow you to use ActiveX Controls within Navigator. Of these, NCompass ScriptActive and Sir Browse-A-Lot are the most notable. Overall, while this should indeed be considered the next major release of Navigator (version 4.0), the web browser in Netscape Communicator definitely doesn't mark as revolutionary a progression as the earlier major releases of the client did. Still, Communicator definitely adds features to the web browser that make it more user-friendly and appealing to use.

Next to the web browser, the two Communicator clients most likely to be used on a regular basis are the Messenger and Collabra Discussions. Both are updated versions of the mail and news clients included in Netscape 3.0. New features in the Messenger include an integrated spelling checker, mail filters (solid but nowhere near as powerful as those included in IE 4.0's Microsoft Outlook Express, Pegasus Mail, Pronto Mail, and several other mail clients), IMAP4 support for server-based management of mail, inline support for message encryption, intelligent HTML sending/receiving capabilities, HTML message composition tools (using the Composer client), global address books (using three popular people search engines), and a revised interface. The Collabra Discussions client offers an entirely new interface for reading news groups; it can also be integrated into the Messenger interface allowing the two clients to work together or separately at your option. Like the Messenger, the Collabra tool lacks advanced filtering capabilities and is rivaled by several independent clients (including Agent and Anawave Gravity). Additionally, other than being able to manage discussion groups with the Collabra 3.0 Server as well as compose and view HTML messages, Collabra Discussions doesn't have much to offer over its predecessors. In fact, it's debatable whether the inline news readers in earlier versions of Netscape were more user-intuitive and efficient at routine browsing of news groups. I'd much rather have the news readers in Navigator 1.x or 3.x than the current client.

Of the final two applications in the Communicator Suite, Conference is unquestionably the more revolutionary tool. The Composer is essentially the same WYSIWYG web editor included in the Netscape Gold package, with the additions of a spelling checker (shared with the other Communicator clients), support for Composer plug-ins, and a slightly improved feature-set and user interface. The Conference client, on the other hand, is an entirely new conferencing tool that puts Navigator's old CoolTalk client to shame. On par with Microsoft's NetMeeting application, Netscape Conference offers many of the same features, including real-time audio capabilities (similar to Internet Phone), a text chat and collaborative whiteboard tool, voice mail capabilities, group browsing sessions (similar to PowWow and Virtual Places), and file exchange capabilities. Conference also utilizes an ultra low bit rate codec (RT24/29) from Voxware that aids in the client's outstanding performance. Overall, Netscape Communicator is the most impressive suite of Internet applications currently available. Communicator excels over Internet Explorer 4.0 in nearly every area, including an overall better browser (ActiveX support notwithstanding), better mail and news clients (advanced filtering capabilities notwithstanding), a solid inline web editor that surpasses IE/Word's inline web editing capabilities, and a conferencing tool that is on equal footing with IE's companion utility, NetMeeting. While IE 4.0 does offer the powerful and innovative Active Desktop, it's still too early to tell whether this feature will be able to live up to its hype. While the gap between the two major browsers continues to narrow, in its latest incarnation Netscape still reigns supreme as the best overall browser on the Net.

Linkbot **Linkbot 3.0**

Desc:	A must-have web analysis tool for ensuring the reliability of your web site
Pros:	Tons of features and customizable options, automated web analysis, excellent reporting capabilities
Cons:	Primarily of use only for web masters, expensive relative to WebAnalyzer, some bugs do exist
Location:	`ftp.tetranetsoftware.com/pub/`
Filename:	linkbot?.exe
Status:	Free 30 day evaluation. Shareware—**$199.95**
Company:	Tetranet Software Inc.
Web site:	`www.linkbot.com`

For many web masters, the most difficult and frustrating aspect of maintaining a web site is not continually updating it with new information, but instead trying to ensure that existing information remains accurate. Large web sites often have upwards of ten to twenty thousand internal and external links; manually verifying even a small portion of these links quickly becomes a Herculean task. Thankfully, tools that automate this process now exist, and of these tools, Linkbot is one of the best. Like InContext's WebAnalyzer (another web analysis tool), Linkbot will scan entire web sites for you and produce reports that detail broken links, missing images, pages with stale content, orphaned (unused) files, pages with slow download times, and much more. The client can also be set up to run on an automatic basis to ensure your web site's reliability on a consistent basis. Linkbot uses an Explorer-like interface to help you explore and visualize the overall structure and organization of your web site. Links into (parent) and out of (child) individual pages can be viewed using this interface, and filters can also be set up to analyze subsections of the site. Once a site has been analyzed, you can either continue using the Explorer style interface or you can publish your report to the Web.

Linkbot's web report capabilities are especially impressive and easy to use. Individual reports that detail your web site are automatically created once Linkbot completes its initial analysis of your site. A top-level site summary provides access to more in-depth reports for eight different Linkbot areas:

- Warnings—pages with automatically redirected links
- Broken URLs—a listing of moved or removed links organized by type of URL error
- Broken Pages—a listing of broken URLs sorted by individual web page
- What's New—pages with content that has been revised within a user-configurable time frame
- What's Old—a similar report for pages that haven't had their content updated within a given period
- What's Slow—a report of large pages that take a long time to download
- Orphaned URLs—a listing of files on your remote site that are no longer needed
- Image Catalog—a complete thumbnail collection of your site's images

The web reporting tool should be reason enough for the majority of web masters to want to fork over the **$199** registration fee for continued use of Linkbot, but the client's feature-set definitely doesn't stop short there.

Unlike some web analysis tools, Linkbot doesn't try to do too much at the expense of its primary focus. Linkbot's sole purpose is the analysis of web sites, and as a result it delivers nearly every imaginable feature possible in this area. Linkbot really shines when it comes to multi-tasking (you're given the option of allowing from 1 to 20 processes to run concurrently), link verification (support for a wide variety of links including web, FTP, mail, image, multimedia, and applet), configurability (tons of customizable options that make it possible to generate reports that meet your most critical needs), and the aforementioned web reporting capabilities. While InContext's WebAnalyzer can be purchased for much less (**$79.95**), Linkbot is more efficient (thanks largely in part to its impressive multi-tasking capabilities), more flexible, and overall, more useful. Because of its narrow focus, you won't be able to download entire sites with Linkbot or use the client as a search engine, but you will have every imaginable tool available to you for analyzing your web site. Overall, this is a must-have client for any web master who wishes to keep his or her site as error-free as possible. Nothing less should suffice, and for this reason, The CWSApps List is proud to display its own "Verified by Linkbot" button.

Combining the best aspects of clients like CuteFTP, FTP Outbox, and FTP Explorer, **Internet Neighborhood** takes the file transfer protocol to the next level by bringing it into the Windows Explorer. Unlike FTP Explorer and FTP Voyager, which utilize Explorer's capabilities and features but do so using their own interfaces, Internet Neighborhood actually allows you to browse and manage remote FTP sites from within the Explorer interface. Using Internet Neighborhood, the contents of remote sites appear as folders and files on your local computer. Working within the Explorer interface allows you to make use of all of Explorer's powerful file management features, including full drag and drop capabilities, various display layouts (large and small icon, display, and list views), quick sorting on multiple keys (including name, date, size, type, and file attributes), right-mouse button functionality, transfer of entire directory structures, and property details for files. Internet Neighborhood rounds out the feature-set with a few FTP-specific capabilities like automatic filename conversion, symbolic link resolution, firewall support, an integrated debugger client, default transfer directory option, and file transfer status/progress bars. Using the Net Neighborhood, you can set up multiple FTP sites for browsing and transferring files; in fact, with the registered version you can set up as many FTP sites as you would like.

Internet Neighborhood KnoWare, Inc.

Desc:	An impressive FTP client that offers seamless integration with Windows Explorer
Pros:	Excellent integration with the Windows Explorer, solid array of features, drag and drop file transfer capabilities
Cons:	Crippled shareware release, desktop icon can't be removed, no 16-bit version available
Location:	`www.knowareinc.com/software/in32.zip`
Status:	Shareware—**$24.95**
Company:	KnoWare Inc.
Web site:	`www.knowareinc.com/index_in32.html`

Both anonymous and private login sites are accessible using Internet Neighborhood, and you can directly transfer files to a FTP site simply by dropping them onto the FTP site's icon. This capability is shared only by FTP Outbox which also allows you to drop files onto an icon and have those files automatically sent to an FTP site without having to first manually log in. At just **$24.95**, the Net Neighborhood offers an inexpensive way to add significant power and flexibility to the Windows Explorer client as well as a greatly appreciated solution for bypassing the need to use external FTP clients. Internet Neighborhood isn't without its faults, of course, but most of its shortcomings are quite minor in importance. Internet Neighborhood works only on 32-bit platforms (Windows 95/NT) and its icon must reside on the desktop for the client to work properly. (This is because the Net Neighborhood operates as a Windows shell extension.) The shareware release is quite crippled in that many features become available only after you have registered the product. Those features absent in the shareware release include the ability to create an unlimited number of FTP sites, rename or delete remote files and folders, create remote folders, and transfer multiple files using drag and drop or the Windows clipboard. The shareware release will give you an idea of the power behind Internet Neighborhood, but to really enjoy its full slate of capabilities, you'll have to fork over the **$24.95** asking price. I'm willing to bet my **$24.95** that you'll be glad that you did.

HTMLed Pro incorporates many advanced features into a program that is extremely easy to use. Intelligent tag insertion, HTML 3.2 support, tag removal, automatic saving with *or without* HTML tags, word wrap, color chooser, QuickKeys (for inserting commonly used pieces of text), an HTML automatic page designer tool, right mouse button functionality (user-configurable), an integrated spelling checker, multi-file find and replace, and custom buttons (also user-configurable) are just a few of HTMLed's advanced features. In addition, the task of creating background images and identifying colors for your web pages is made easy with HTMLed. With QuickKeys, custom buttons, and customizable right mouse button functionality are all at your fingertips, HTMLed Pro offers more options than any other HTML editor for personalizing the service to your needs. QuickKeys for routine and oft-used features like spell checking and insertion of common tags, a repeat button for automatically re-entering commands, and HTML templates for creating common pages are all critical time-saving activities built-in to the HTMLed interface.

Perhaps the best features of HTMLed Pro are its Form, Table, Frame, and Image Map Designers which allow you to easily and attractively set up your own forms, tables, frames, and image maps. Among all the HTML editors currently available, these Designers are perhaps the best available tools for creating advanced forms and tables. Still, the form designer could be improved by implementing scripting capabilities (Perl or CGI) for handling the back-end processing aspect of forms. Another of HTMLed Pro's better features is its remote file uploading and saving capabilities. You can even have your .HTM files automatically renamed to .HTML files after being uploaded. HTMLed Pro, like many of the newer HTML editors, contains many, many features, but unfortunately, HTMLed does lack an HTML tutorial and the depth and breadth of online help documentation common to editors like HotDog Pro and WebEdit. The interface of HTMLed is also considered by many to be less attractive than those of its close competitors. Like the best HTML Editors on the Net, HTMLed Pro is one of those that just keeps getting better and better all the time. If you haven't gotten a chance to check this one out yet, by all means do so. ◆

HTMLed Pro

HTMLed Pro (v. 2.0c)

Desc:	The commercial pro release of the extremely popular HTMLed web editor
Pros:	Intelligent tags, excellent custom Designer tools and many more advanced features; easy to use
Cons:	Lack of online help, expensive (relative to HTML Writer), interface could be more attractive
Location:	`ftp://198.164.20.20/pub/ist/`
Filename:	htx32_??.exe
Status:	Free 30 day evaluation. Commercialware—$59.95
Company:	Internet Software Technologies
Web site:	`www.ist.ca/htmledpro`

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The PowerRack also has the standard feature list: dial-in/dial-out access, a powerful RISC CPU, Ethernet connectors, ISDN capability, PPP, SLIP, CSLIP, *bootp*, *rlogin*, *telnet*, reverse *telnet*, PAP/CHAP authentication, RADIUS II, RIP II, SNMP MIB II, subnet routing, IPCP DNS exts. for Windows 95, and IP filtering.

PowerRack user and Internet Service Provider Michael Behrens, of InterNet Kingston (mbehrens@kingston.net), commented, "The PowerRack is an attractive product, both in its ability to do the job well and to do the job. . . cost effectively. Port for port costs are significantly lower than the Livingston Portmaster. The product lives up to its name. . . performance under load is exceptional! The PowerRack also offers a significant feature for feature comparison against the available competition (i.e. Livingston Portmaster). And, technical support was extremely knowledgeable and responsive."

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Providing industrial-strength Internet hosting services, DIGEX is home to many of the most popular and innovative web sites today, including Bombay Company, Allstate Insurance, Ernst & Young and Net Grocer. By going beyond the RISC/UNIX alternative and partnering with Compaq, they made doing business on the Internet a much easier and more accessible undertaking for thousands of businesses.

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TUCOWS

Scott Swedorski

HTML EDITORS

So your ISP gave you a new home page with your new Internet account. Finally! Access to the worldwide stage, a place to display your talent, your skill, your ideas. Wait a second, what's this about learning HyperText Markup Language?

Scott Swedorski is president and founder of TUCOWS, The Ultimate Collection of Winsock Software. He lives in Flint, Michigan with his wife, Vicky and 2 daughters, Emily and Ashley. After joining the army at the tender age of 17, Scott received his degree in Computer Information Systems from Mott College, and received an Honorable Discharge after 8 years service. Scott welcomes input from Internet users and software developers at tucows@tucows.com.

Many new Internet users (and a few old hands) used to be detoured along the road to their contribution to the Web, because there were no simple, graphical tools to help them build their web sites. While HTML is a relatively simple code, most computer users are used to WYSIWYG ("What You See Is What You Get") editors like Microsoft Word or PageMaker. When commercial and public interest began to take off, it was a standard joke amongst the old-timers to recommend Windows Notepad as the "best" HTML editor (some still swear by it).

Things have changed in the last while though. Now there seem to be too many HTML editors available. They vary greatly in terms of size, price and functionality. In this look at Internet software, we will take a tour through some of the best HTML editors and tools available on TUCOWS.

WINDOWS 95 SOFTWARE

HIPPIE 97

Version Number:	1.1
Byte Size:	2,391,898
License:	Shareware
Homepage:	pages.prodigy.com/Hippie
Author:	Trout Software
Cost:	$39.95

Hippie 97 is a groovy, intuitive HTML editor that shows you a real-time view of the HTML file you are working on, auto-updating with any changes you make, as you go along. The viewer handles any tag that IE 3.01 supports. One handy feature is the capability to open an online URL and edit the page, then re-upload it with a built-in FTP client. Hippie 97 features configurable toolbars, upload capabilities, HTML validation program, built-in spell-check function, links to the MS ActiveX Control Pad and much more. You will need Internet Explorer 3.01 or better to make the most of the real-time features.

To make the best use of Hippie, it does help if you have a basic knowledge of HTML. Nevertheless, even a beginner can quickly pick up speed by experimenting with the interface. One advantage Hippie offers is the ability to manually configure your HTML with immediate results — you don't have to switch between applications to find out what the results will be: the preview box updates as you move along, giving you instant feedback on your new design.

NET-IT NOW!

Version Number:	1.5a
Byte Size:	2,918,974
License:	Shareware
Homepage:	www.net-it.com/
Author:	Net-It Software Corp.
Cost:	$295.00

Net-It Now! lets you transform desktop documents into cross-platform, instantly viewable, live web pages. Click one button to publish your documents as dynamic web pages that require no software plug-ins or ActiveX controls to view on any computer platform. Enliven documents with active pop-ups, highlights and other interactive styles.

Net-It Now is not really an HTML editor. Rather than using the standard HTML tags, you use a word-processor type interface with a graphical interface. You paste graphics in the window where you want them, add hot-spots that activate when the visitor's mouse is over the spot, and they in turn highlight, do popup windows, activate menu-looking popup's any of which can also cause other behaviors when clicked like jumping to a URL. When you are all done putting all your graphics and additions together, Net-It compiles it all into a Java program and, when you hit publish, place it on your web site where any Java-enabled browser can view it. Even easier, you can make an attractive, graphics oriented project in another application of your choice, hit print, pick the Net-It Now! print driver, and it will send it to Net-It Now! Lastly, add your hot spots and you're done. A simple way to make a page that looks as good as the big professional sites and you do not have to know a bit of Java or HTML to do it!

WINDOWS 3.X SOFTWARE

WEBMASTER GOLD

Version Number:	1.0
Byte Size:	2,490,855
License:	Shareware
Homepage:	www.ozemail.com.au/~vtech /webmaster.html
Author:	V-Tech Software (Australia)
Cost:	$29.95

WebMaster Gold makes creating serious web pages a snap. It comes with many exciting new features, including integrated document previewer, predefined document templates and much more. WebMaster Web Editor Version 1.2 is a feature-rich web editor that combines power, value and ease of use. Major features include Integrated Document Previewer, User Defined HTML Tags, 255 levels of Undo/Redo, Convert HTML Documents to text, spell check, Point & Click Color Selection, WYSWIG Tables Designer, Forms, Toolbar functions, Popup ToolTips HTML Reference Guide, HTML & Web Page tutorials, Java tutorials, and much more.

In addition to an image library of almost 300 re-usable images, there are several templates for beginners to choose from, from basic sites to multiple framed site formats. One of WebMaster Gold's best features is its selection of helpful step-by-step tutorials on the basics of HTML and web design.

MACINTOSH SOFTWARE

One of the best Mac-based HTML editors on the Web, BBEdit Lite 4.0 is an industrial-strength freeware text editor that is a derivative of BBEdit 4.0, the popular and critically acclaimed text and HTML editor for web authors, programmers, online-service users, and anyone else who needs to edit plain-text files. BBEdit Lite 4.0 features drag and drop text editing. Having made a selection, you simply drag it to wherever it needs to go: another location in the same document, another open window, or another application. If you drop your text selection in the Finder, and the "Clipping Extension" is installed, the system will create a clipping file, which may be re-used at any time. You can also insert a file's contents into a text document by simply dragging and dropping it from another location. To insert a folder listing, drag and drop a folder (or an alias to a folder), or even an entire disk.

BBEDIT LITE

Version Number:	4.03
Byte Size:	797,264
License:	Freeware
Homepage:	www.barebones.com/
Author:	Bare Bones Software, Inc.
Cost:	$119.00

BBEdit Lite is shipped with a QuickStart document, which describes many of the application's features. Full documentation, as well as a considerable amount of additional functionality, is available with the purchase of BBEdit 4.0. This freeware version though, is loaded and ready to go. BBEdit is optimized for the editing, searching, transformation, and manipulation of text. It includes many features which have been specifically developed in response to the needs of software developers and HTML authors, including support for 13 languages (including C and C++ , HTML and Java, Perl, Pascal, and others), an HTML-aware spell check, HTML Syntax checking, FTP from the file menu, and a great deal more. ◆

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ISP$ MARKET REPORT

Paul Stapleton

CASH FLOW IS KING; EBITDA IS NOT CASH FLOW

PSINet Inc. (Nasdaq: PSIX) and Netcom On-Line Communications Services Inc. (Nasdaq: NETC) both released first quarter 1997 earnings in late April. I was impressed with both companies' improvement. Both have taken some of the steps needed to become solid industry players. Compared to the first quarter in 1996, both increased revenue dramatically. PSINet narrowed its loss while doubling customers to 20,900 corporate accounts and increasing revenue per employee to **$200,000**. PSINet also sold the last of its peripheral businesses, InterCon Systems Corporation, and began providing "performance metrics" to help analysts understand the business. Netcom grew its customer base 48 percent to 580,000 and its hosting business to 7,955 customers, another 49 percent increase.

After bouncing back and forth between finance, publishing and the Internet, Paul Stapleton has landed squarely in the middle. He is Managing Director of Stapleton & Associates, an Internet focused financial consulting firm. Clients include major players as well as start ups and middle market companies in media, telecomm and software.

Paul Stapleton is also editor of *ISP Report* (to subscribe, e-mail `ispreport@mediabiz.com` or call **303-271-9960** or fax 303-271-9965; annual rate is $195; sample issue sent on request) the newsletter of record for financial activity in the ISP industry. Paul welcomes comments and suggestions at `paulstapes@aol.com`. He lives in Boulder, CO with his lovely new bride.

Financial Performance For 1st Quarter '97

Financial Performance	PSINet (millions)		Netcom (millions)	
Revenue	$25.6	+50%	$39.0	+62%
Earnings per Share	-$0.23	+41%	-$0.79	-34%
EBITDA	-$6.8	+33%	-$1,250	+59%
Free Cash Flow		?		?

But there it was, in the second paragraph of each of the press releases: **A sign that the ISP industry may make the same valuation mistakes other network industries have made before**. In the PSINet press release, William L. Schrader, chairmen, president AND chief executive officer, said, "We are also pleased to be proceeding on plan towards positive EBITDA and bottom line profitability." In the Netcom press release, David W. Garrison, president and chief executive officer said, "We are pleased to report a 326 percent growth in positive EBITDA from our U.S. operations..." Both companies went on to report their EBITDA numbers for the first quarter of 1997 and 1996.

In valuing and managing a business cash flow is king. But, contrary to some misconceptions, EBITDA is not cash flow. Since there can be only one king, EBITDA is not king. If you focus on it, then you will get in financial trouble.

For the finance novice, EBITDA stands for "earnings before interest, taxes, depreciation and amortization." EBITDA is often confused with Free Cash Flow by analysts and others interested in valuing a business. They assume EBITDA is a good measure of the cash flow a business will throw off. They then calculate a discounted present value or assign an industry multiple to the alleged cash flow to determine what the business is worth.

However, EBITDA ignores a very important economic fact. Businesses must reinvest to stay in the game. Businesses require capital investments. Companies need to ask how much of the year's cash flow must be used for new plant and equipment to maintain or improve sales and volume? Therefore, when determining a cash flow from which to value a business, one must use Cash from Operations minus Capital Expenditures and additional working capital needs. Here is the formula:

Free Cash Flow = Net Income + Depreciation Amortization - (Capital Expenditures + Additional Working Capital).

Let's call this the *Free Cash Flow*. I use Free Cash Flow to value businesses. This number recognizes that, over the long term, a business must reinvest in its plant and equipment. And in the ISP industry, "the long term" is pretty short.

Perhaps I am over reacting ... but I've seen investment bankers confuse Free Cash Flow with EBITDA. EBITDA has sometimes been called an acceptable substitute for Free Cash Flow. Sometimes it has been considered an appropriate number to use to value businesses that have large investments in the beginning and much smaller outlays later on. Network industries, such as cable and paging, are often thought to be such types of businesses. The problem is that this assumes capital investment in the business never has to be made.

These older network industries are now paying the price. Properties were bought, often with debt, based on EBITDA, as if EBITDA were a long-term free cash flow number. Today, Wall Street analysts perceive the cable industry as debt-laden, unable to deliver long promised earnings and unable to invest in new network technologies from internally generated cash flow.

They are correct.

Their networks require major capital expenditures for upgrade, but their cash flow is being used to pay debt. No one bothered to say, we need to save some of that cash flow to upgrade the plant in the late nineties. Many believed the plant was a one time investment or so far down the road it did not really matter when trying to value the business. Or, they believed a "greater fool" would come along. And sometimes he has.

For better or worse, ISPs know all too well about the need to constantly upgrade plant and equipment. Many are sitting around trying to figure out how to finance a 56 Kbps modem upgrade just two years after upgrading to 28.8 Kbps. My concern is that EBITDA is being ported over to the ISP industry. It is appearing in press releases and has slipped into the ISP vernacular. But while often used, it is rarely understood.

Symbol	Exchange	Company	Price 3/12/97	Price 4/10/97	Price 5/1/97	Monthly Price Change	Market Capitalization (Millions)
AOL	NYSE	America Online Inc.	$44.25	$46.63	$47.63	2.14%	4,476.13
BBN	NYSE	BBN Corporation	20.13	17.00	23.00	35.29%	483.30
CSRV	NASD	CompuServe Corp.	10.13	11.75	9.38	-20.21%	868.13
DIGX	NASD	DIGEX Incorporated	10.63	7.25	8.63	18.97%	97.33
ELNK	NASD	Earthlink Network, Inc.	10.69	10.50	8.63	-17.86%	81.44
IDTC	NASD	IDT Corporation	6.00	5.25	5.75	9.52%	119.84
WWW	TSE	iSTAR Internet inc.	2.20	1.61	1.51	-6.09%	28.52
MSPG	NASD	MindSpring Enterprises, Inc.	8.25	7.88	8.13	3.17%	60.74
NETC	NASD	NETCOM On-Line Comm. Services	9.23	9.88	10.63	7.59%	123.58
OZEMY	NASD	OzEmail Limited	8.50	6.50	6.44	-0.96%	65.66
PSIX	NASD	PSINet Inc.	7.13	6.94	6.13	-11.71%	245.43
RMII	NASD	Rocky Mountain Internet, Inc.	2.25	2.06	2.25	9.09%	8.72
		INDUSTRY AVERAGE	$9.95	$11.10	$11.51		*TOTAL* 6,658.81

Now, I don't really fault any company for reporting its EBITDA. If properly used and understood, EBITDA is a legitimate performance metric. This number provides an indication of the operating performance of the business after backing out the expense caused by different capital structures. Network companies often have very different capital structures. For example about **$54.1 million** or 40 percent of PSINet's capital structure is debt. Netcom has no debt, except for some small capital lease obligations, on the balance sheet. So, looking at each company's EBITDA is a useful way to compare them, all things equal. EBITDA strips away the interest and tax expenses caused by different capital structures. It also adds back non-cash expense items and allows an analyst to see them from a "clean" operating point of view. Just do not forget to add back interest, taxes and future capital expenditures when trying to find the Free Cash Flow number from which to value the business.

Positive EBITDA is also a signal to acquiring companies. Hey, its okay to buy me, my operations will not bleed any cash. But, it is not a long term guarantee of profitability or even free cash flow.

I realize this definition of Free Cash Flow may require estimates too vague for some analysts. Calculating future capital expenditures, especially in an industry changing its technology and price points very quickly, is not a precise science. It may require rough estimates. But to paraphrase, better to be approximately correct than precisely wrong.

Wall Street may be starting to think similarly. The stock prices of network industries such as cable and paging are incredibly low. These networks have shown no earnings for years, have invested cash flow in overpriced properties and now have no cash flow for needed major capital improvements. Analysts have been told for a long time that earnings were just around the corner, and now they are being told, "Well, maybe after we spend some more on the network." Wall Street is responding by saying, "Well, until we see these businesses can be managed to generate Free Cash Flow, we're not interested." ◆

SMALL OFFICE CONNECTIONS TO THE INTERNET

by Jack Rickard

Our February 1997 cover story on connecting the small office to the Internet hit a bit of a nerve, and we've had a number of somewhat detailed private communications asking more about the 12,600 ways we DIDN'T write about on how to connect a small office to the Internet. So we've taken a closer look, and found some aspects to Internet access that almost define the extraordinary gap between the few thousand net-heads that run the Internet and the rest of the world.

Internet services today fall into three basic modes. Dial-up access at **$20** per month is one service that gets a lot of attention. Web hosting is growing dramatically as a lot of entities discover that the economics of building a web server that might get 50 visitors this week, or perhaps 250,000, as the mood of the network strikes, are a little gruesome. Hosting your web site on an ISP's iron and connectivity is growing in popularity. Finally, a lot of ISPs offer connectivity to what is broadly defined as "business" connections.

Different ISPs roll these three elements in varying combinations. Some offer dial-up accounts exclusively. Some specialize in web hosting and design services. And others focus on business connections. Most offer some combination of the three, and everyone is convinced that someone else has the real approach that makes all the money.

The business connection is the most magical. Everyone agrees that businesses are where all the money is, but not everyone can agree just what a business is, how to market to them, or what they might want to buy. General Motors, Coca Cola, WalMart, and Pillsbury, by all accounts, would be desirable customers.

Meanwhile, in the reality zone, the majority of "businesses" are much smaller, and thus far, they're not quite online. There are a little over seven million "businesses" with fewer than 100 employees operating within the United States. We found it interesting to learn that just under 15 percent of those business had a local area network—a little over a million, and that about half of those were connected to the Internet. Additionally, it is interesting to note that about 1.1 million businesses that *don't* have a LAN, *are* on the Internet—using cheap **$20** dial-up accounts. That would seem to indicate that there are over a half million small businesses with LANs and no connectivity, and over a million additional businesses with computers and dial-up connections, with no LANs. Any way you cut it, there is a large number of small businesses who use computers but aren't connected to the Internet in any meaningful way beyond an e-mail box on a dial-up network somewhere—if that.

This represents an enormous market for Internet service providers—if they can figure out what these companies need and find a way to get it to them. To do that, we have to look at what a small business faces to usefully connect to the Internet. It is pretty much a mess revolving around expense, complexity, and technical competence. The truth is that for many companies, it just isn't worth the bother.

First is the expense. Most ISPs, and indeed the Internet in general, lacks granularity in their product lines. A basic dial-up account is roughly **$20**. Most ISPs at this point insist that this is for a "personal" account and issue reams of "terms and conditions" purporting to prevent business use of the cheap accounts. The major effect is to virtually guarantee an ongoing war with their customer base that is intrinsically nonsensical. The next "increment" is a business dial-up account at **$75** to **$150** per month—four to eight times larger in monthly cost, and worse, involving **$5,000** to **$10,000** in up front costs for

routers, UNIX servers, and even more for someone to piece all of that together to usefully connect a business to the Internet. This would still be for a dial-up account, but for one that is more or less dedicated to that business. A Frame Relay or fractional T-1 account can be had for **$300** to **$500** per month, and the average cost of a full T-1 is currently **$1,200** per month—not counting an additional **$600** or so monthly for the local loop connection to the ISP.

Part of the problem is that any time a business calls an ISP about a connection, the ISP too often immediately starts babbling artlessly about the 1.544 Mbps T-1 account. They are rather anxious to sell them as they are clearly more profitable than the **$20** per month dial-up account. But few of these businesses really need a 1.544 Mbps connection, have the expertise to use such a connection, or any desire to jump into the Internet at **$2,000** per month or more. So they generally just go away—slightly confused and certain that it is all too expensive. They perceive a need to connect their LAN to the Internet for electronic mail, maybe do a bit of web browsing, and perhaps have their own domain name. The **$100** business dial-up account would be plenty to start with, and they really don't want to pay that. The **$1,200** monthly solution looks even worse when the ISP informs them they will ALSO have to cough another **$600** to the telco for "local loop charges."

But what they REALLY don't want is to buy a pile of expensive equipment they don't know how to operate at **$5,000** to **$10,000**. Almost none of them needs e-mail that badly. And there have been few packaged solutions at any price. Our February article on eSoft's IPAD device was well received, and we like the product. (`www.esoft.com`) But at **$7,000**, it too may be overkill for some applications. It is sufficiently powerful that a number of small ISPs actually use this device to offer Internet access services to the public and a number of businesses and schools use it to act as "internal" ISPs within their organizations. The learning curve is much easier than building a UNIX server from scratch, but in many ways still beyond the level of expertise readily available at a small business.

Finally, there is the complexity. Small businesses that aren't already in the Internet business find the entire task of making the connection hopelessly complex with dozens of devices, servers, and configuration elements quite beyond the concept of an office LAN with internal e-mail. The bottom line is that it is just too hard for what benefits might be derived. The experience of discussing what's needed leads to overwhelming feelings of inadequacy and the vague feeling that this is a quick way to get fleeced of a good bit of money with no expectation of success. This isn't helped at all by ISP terms and conditions, documents that basically promise NOT to provide ANY connectivity and if even THAT is lost they can't be held responsible in any way.

So the conclusion for many is that this Internet concept is just not ready for prime time. Many of the ISPs are hopelessly inept in dealing with businesses—aside from the aforementioned comically written service agreements.

But we are finally beginning to see some basic Internet appliances that make connecting a small office LAN or SOHO to the Internet at an attainable price and without seven semesters of, CompSci. Two of the most promising are Whistle Communications Interjet and Apexx Technology's Team Internet.

Both products follow essentially the same concept—put UNIX in a small non-threatening box that doesn't even look like a PC, hide most of the configuration nightmare, and price it under **$2,000**. Use Dynamic Host Configuration Protocol (DHCP) and a pseudo-IP number scheme to connect Windows and Macintosh clients to this box without the usual Internet Protocol address assignment confusion, and share an outbound connection to an ISP using a dial-up 33.6 Kbps modem, an ISDN adapter, or Frame Relay for speeds up to that of a T-1. In this way, LAN users can get e-mail from this box and share the connection out to the Internet for web browsing. If you can make it installable, you can probably sell it.

WHISTLE INTERJET

Whistle Communications has done a superb job of analyzing the market need here and putting together a consummately professional package. Basically, the InterJet is a futuristic toaster with a mission—connect the unconnected small business. It was named the InterJet as a play on the Hewlett-Packard LaserJet and DeskJet printers. Whistle wants this Internet connection box to be viewed by small business as analogous to a LaserJet.

The company was started in December 1995 and rolled out their InterJet 100 last September. The most interesting thing about this box is that Whistle has made a valiant attempt to get it to configure itself for the most part. At this point, it is ONLY available through Internet service providers. Basically, the ISP sells the box; Whistle drop ships it to the customer. The customer gets a single page SETUP SHEET with a 24-digit registration code and a dial-up telephone number to the ISP.

The device has a tiny LCD screen on the front of it with a keypad. The user types in this 24-digit code and the dial-up access number. They connect three things to the box—a power cord, a phone line, and an Ethernet cable to a PC. It then automatically dials the ISP, obtains all the needed configuration information regarding gateways, DNS servers, mail, etc., and is basically operational from there.

THE TOASTER

The box itself is something of a marvel. It is actually a 75 MHz 80486 Intel microprocessor with 8 MB of RAM and a 1.2 GB hard drive. It uses a version of the FreeBSD UNIX operating system with some Whistle software. But it's packaged in a box the size and shape of a toaster. It has no real keyboard or monitor.

It does have a four-port Ethernet hub built into the back of it. With this box, you can connect four PCs to the InterJet and not only get the Internet connection, but a basic local area network by default. The InterJet will even act as a kind of file server as a byproduct and it works fine with Windows95, Windows NT, Windows for Workgroups, Windows 3.1, or Macintosh. It serves files for Windows networks or for AppleTalk.

The unit also has its own built-in 1.2 amp-hour battery uninterruptible power supply. This is a bit interesting. UNIX just doesn't like sudden power outages. You really must do a graceful shutdown of the operating system before removing power so it can save some OS operating data to disk. But non-technical small business users are more accustomed to PCs that you simply shut off when you're not using them. If you unplug the InterJet, or hit the power button, the UPS keeps the system up while it does a graceful shutdown. Again, somebody thought this thing through stem to stern specifically for the market it was intended.

CONNECTIVITY

The version we received had an internal US Robotics 33.6 Kbps modem built in. It also has a 9-pin external serial port and can use an external modem, an external ISDN adapter, and ostensibly Whistle will have a Frame Relay card option allowing connections up to the 1.544 Mbps T-1 speed. The theory is that once a company has their LAN online and is doing e-mail, web browsing etc., the natural need for more bandwidth will lead them to higher bandwidth connections from the ISP.

This is actually a pretty good concept. Again, too often ISPs want to sell a T-1 connection or nothing. But in practice, if they can get a company on the network at 33.6 Kbps, it works out, and it's just a matter of time until they want to grow into larger pipes.

The review unit we received dialed an 800 number at `whistle.com` and was connected within minutes. We got a surprisingly good connection even long distance.

One of the basic elements of this package is that multiple users on the LAN can share a single Internet connection for browsing the Web. This actually works. It might appear obvious that with more than a couple of users actually downloading large graphics files, things do move along a mite slowly. But the convenience of having several machines connected via a single phone line is pretty strong.

Unfortunately, the overhead of using such a gateway is substantial. In the case of the InterJet, we measured connectivity to six web sites via the InterJet, compared to using a direct modem connection from the same computer. We measured raw download bandwidth using a little utility program titled *TcpSpeed*. With NO other users even connected to the box, there appeared to be a significant bandwidth penalty for going through the InterJet. Tapping four variously located web sites and taking five readings from each, we averaged 55.2 Kbps download bandwidth. On a direct dial connection from a PC, we averaged 81 Kbps. If it's performance you seek, this isn't where to find it.

The connection can be configured in various ways to dial-on-demand, disconnect after some period of inactivity, or remain connected all the time.

E-MAIL

Almost any Internet service provider can provide multiple e-mail boxes or alternatively, dump all e-mail for a specific domain name into a single POP e-mail account. Whistle's partnership program with ISPs takes all the negotiation out of this. The Whistle Commander software, run at the ISP end, is basically a set of Perl scripts that run on any UNIX server. It configures the e-mail system on the ISP end to support the InterJet. As a result, the InterJet customer doesn't have to deal with getting the right kind of account.

After configuring a PC with the Whistle client software, essentially an install wizard for Netscape 2.02, the customer simply goes to **//INTERJET** using the Netscape browser—a web server containing some HTML configuration pages. This allows the user to logon to the InterJet as **ADMIN** with password **ADMIN**. To add a new mailbox, enter the user's name, logon name, and password. There are plenty of options for setting the size of the allowed mailbox, vacation options, how long mail is held, how often it is swapped with the ISP, etc. But it's all done with little HTML forms that are easy to deal with.

The Whistle "agent" software also provides some diagnostic tools that are interesting and easy to use—providing a surprising level of detail down to packets sent and received by everyone on the network, but again its not hard to deal with.

Technically, it has built in SMTP, POP3, and IMAP mail server daemons and you can use any e-mail package that is capable of using Internet mail. It configures the Netscape e-mail program but also comes with PC-Eudora.

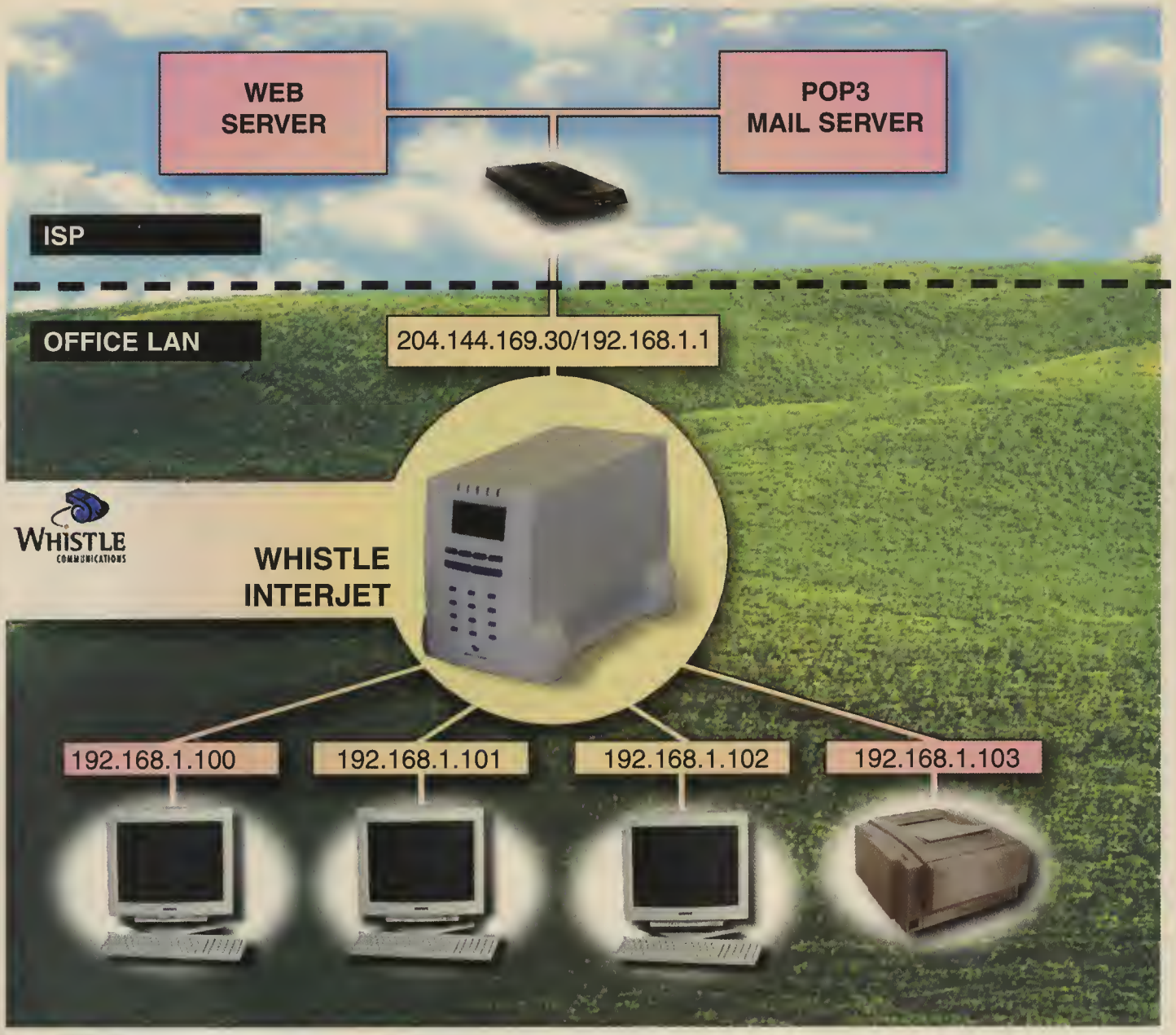
The magic here is, of course, that you don't configure sendmail *et al* in the usual fashion. This restricts some of the things you can do, but it also makes it simple to set up and maintain.

The system comes with "client software" allowing you to set up other machines on the network quite easily. We found this less than foolproof on machines that had already had TCP/IP installed. But on a bare Windows95 machine that had NOT previously been connected, it was really quite easy to use.

IP NUMBERS

Like many similar devices, the InterJet does not really set up a Class C Internet address. Rather, it uses the 192.168.1.xxx convention. This is a kind of pseudo Class C with the full 255 addresses, but 192.168.1.xxx by convention doesn't actually exist on the Internet. It is used for isolated private networks. The InterJet then "translates" these IP addresses when communicating with anyone on the public Internet to appear to be a single IP number—which can be dynamically assigned. The 192.168.1.xxx addresses only exist internally. Most of these proxy agent gateways use this convention.

This has a couple of advantages. First, it simplifies network setup and administration. The software can assume the network addresses to some degree. But further, it actually offers a bit of security. No one on the rest of the Internet can actually access a machine on the local network because they don't actually have a true IP address. This creates a bit of a crude firewall all by itself.



It does have some limitations. For example, we found the Microsoft PING command worked fine over this network, but TRACERT didn't actually work. Whistle provides their own TRACEROUTE function in the diagnostics menu, but it is possible that some applications just won't work through the IP number translation.

Most will. We got Pointcast to update over the network, for example, and both Netscape and Microsoft Internet Explorer worked just fine. Our TcpSpeed utility worked well.

Within the local network, the InterJet provides a Dynamic Host Configuration Protocol (DHCP) server. With a Windows95 client, this automatically assigns the pseudo-IP numbers dynamically and allows any machine on the local network to find any other machine automatically.

WEB MIRRORING

One of the fascinating features of this product is that it does include a copy of the Apache web server software—undoubtedly the most popular web server product on the network. InterJet also includes the Claris Homepage HTML editor and a series of pre-designed templates to setup simple web pages.

This allows you to put up an internal "Intranet" web page, and in fact, all users on the system can each have their own personal web pages.

But again, Whistle shows some real polish in the design of all of this. Accessing a web page connected to the network with a 33.6 Kbps connection is a new adventure in slow. Most ISPs are now doing a bit of business in hosting web pages for their customers. The pages are stored on the ISP hardware, and are accessed over the ISP connection to the Internet. This service, often starting for as little as **$75** to **$100** per month, allows a small business to have a pretty capable web page without actually worrying about hardware capacity or bandwidth. But mastering the elements of updating web pages located on the ISP using the File Transfer Protocol (FTP) can be non-trivial.

InterJet pretty much trivializes it. Customers simply sets up their web pages locally on the InterJet and sets it to "mirror" to the ISP—updating on whatever schedule is desired. The InterJet automatically updates the files located at the ISP to mirror the local files. In this way, the customer simply maintains a local page on the InterJet machine, and changes are automatically reflected on the ISP hosted version. This is a terribly slick innovation that, when properly coordinated by the ISP, simply takes all the pain out of maintaining a web site remotely.

WHISTLE SUMMARY

Whistle Communications stakes out a claim to simplifying the process of connecting small businesses to the Internet. By partnering with ISPs and combining the hardware, software, and ISP account information into one very slickly designed package, they've covered a lot of ground toward that goal. This is an excellent solution for small businesses and a very attractive tool for savvy ISPs seeking to move some of their business users up from the basic **$20** dial-up account into higher margin business connectivity. Realistically, with this product, a small business can spend **$2,000** on the product, an afternoon setting it up, and a recurring cost of **$75** to **$150** per month to make a truly useful connection to the Internet. Better, if they had three or four machines and no local area network previously, they have a rather painless one now whether they wanted it or not.

The InterJet 100 is priced at **$1,995**. An InterJet model 120 features 16 MB of RAM and a 3 GB drive for larger LANs at **$2,395**. Whistle currently lists about 31 Internet service provider partners at `www.whistle.com/partners.html`. ISPs wishing to partner can contact Brian Lawley Director of Product Management, Whistle Communications, `blawley@whistle.com`, 415-577-7022.

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APEXX TEAM INTERNET

Apexx has a similar concept with their TEAM Internet product. The basic box is a 66 MHz 80486 microprocessor with 8 MB of RAM and a 630 MB hard drive.

The box looks more like a small videocassette recorder. The system uses the Linux operating system kernel—a free UNIX clone that has achieved enormous popularity. This is packaged with the Apexx Internet Gateway System software. TEAM Internet is priced slightly lower at **$1,495** with a 33.6 Kbps modem or **$1,995** with a 128 Kbps ISDN adapter. It is available to all and there are no formal programs for packaging with Internet service providers.

The TEAM Internet box did not include a built-in Ethernet hub, uninterruptable power supply, or any panel controls.

TEAM Internet provides an internal DHCP server and 192.168.1.xxx pseudo IP number translation in essentially the same fashion as the Whistle InterJet. Most programs worked well with this and again, TEAM Internet provided diagnostic tools such as PING and TRACEROUTE that worked with the system.

ELECTRONIC MAIL

The TEAM Internet is somewhat more open and flexible than the Whistle—at a cost in complexity. Since it does not come packaged with an Internet service provider offering, the user must deal with a lot of the detritus that hampers small business connections anyway. First is the concept of electronic mail. The TEAM Internet box can "mirror" the individual mailboxes of up to 500 POP3 e-mail accounts. It does this by dialing the ISP, and sequentially downloading the mail from each account. Alternatively, it can be configured to use a single "multi-drop" e-mail box. This is a single POP3 mailbox that contains mail to a number of users at the same domain. But this needs to be worked out with the ISP, and the ISP's system has to format the electronic mail properly so it can be further distributed.

Like the Whistle Interjet, TEAM Internet provides a local web host with HTML configuration pages. But we found these more awkward to use, and really didn't simplify configuration. It simply failed to automate the configuration process. Little was actually simplified. You still need to know the domain name server, the gateway machine, mail server, etc. The configuration mess was simply moved to minimally attractive HTML pages rather than the usual text configuration files.

For example, the ISP information page allows you to enter the name of the mail server and the name of the domain name server. But it then returns an error because while the name of the mail server is sufficient, you naturally must enter the IP number of the DNS server or the system can't lookup names. Nothing on the screen gives any indication of this.

Configuration of individual e-mail boxes, and the client side setup were also a little less polished. A diskette was provided to set up client machines.

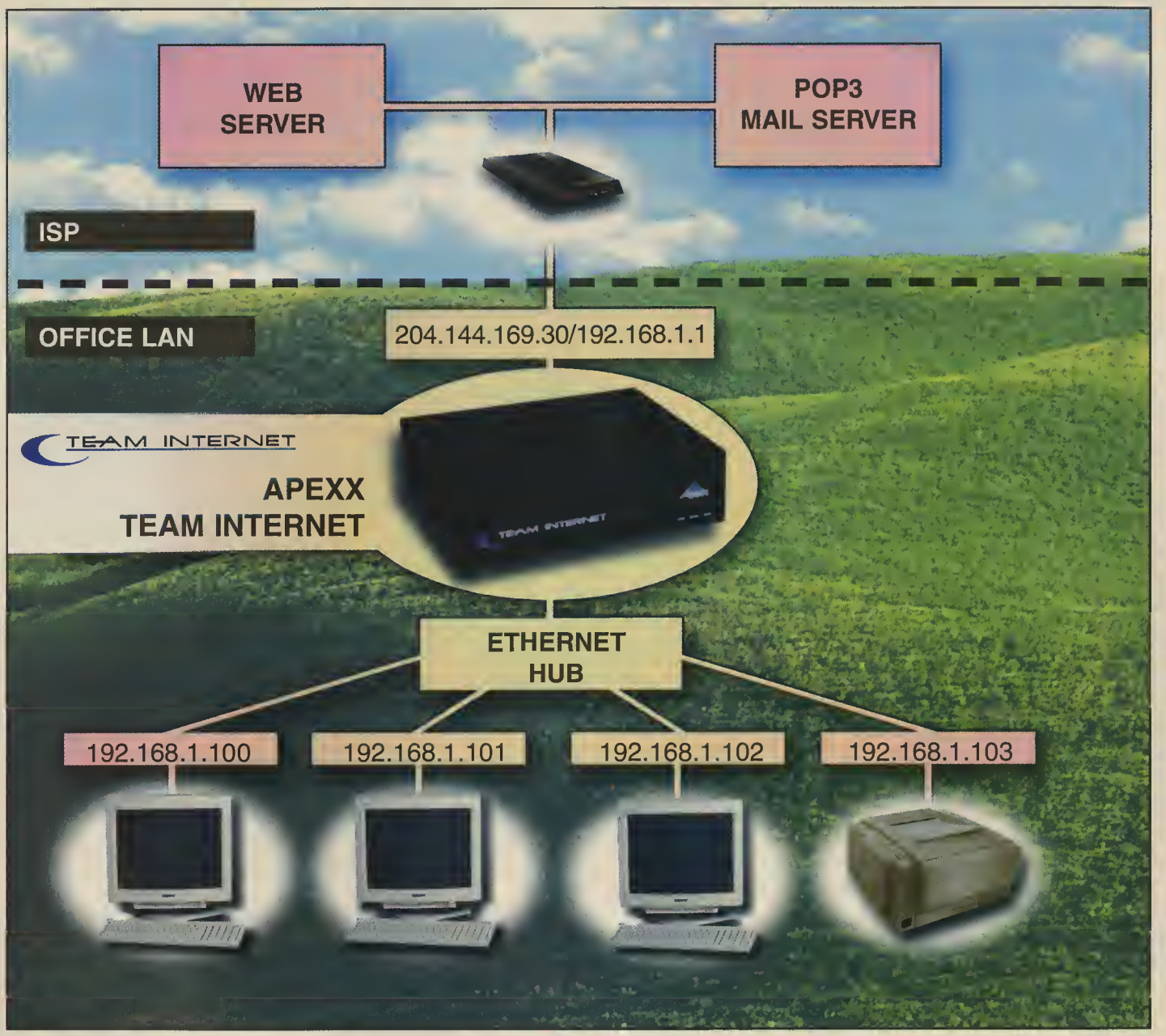
THE CONNECTION

TEAM Internet offers a nearly identical series of connection options—including 33.6 Kbps modem, 128 Kbps ISDN adapter, or Frame Relay card for connections up to T-1 speeds. We found the performance penalty of IP address translation much less noticeable with a download speed average of 76.5 Kbps compared with a direct connect speed of 81 Kbps or the Whistle InterJet's 55.2 Kbps.

Like the Interjet, the TEAM Internet can be configured to only be up during certain hours, disconnect after periods of inactivity, or dial-up as needed. The options were more flexible, and consequently more complicated to set up.

WEB SERVICES

TEAM Internet configuration is performed on HTML pages within the box. But to get it running, in Windows95 you must configure the administration PC to use the pseudo IP numbers, and then use the RUN function of Windows95 to run the setup program. With the Linux kernel, it should be possible to install an Apache or other web server software on this box, but none came configured on the machine, and there was certainly no mirroring procedure as provided on the Whistle.



Team Internet is priced at **$1,495** with the 33.6 Kbps modem. An ISDN upgrade is available at **$595**.

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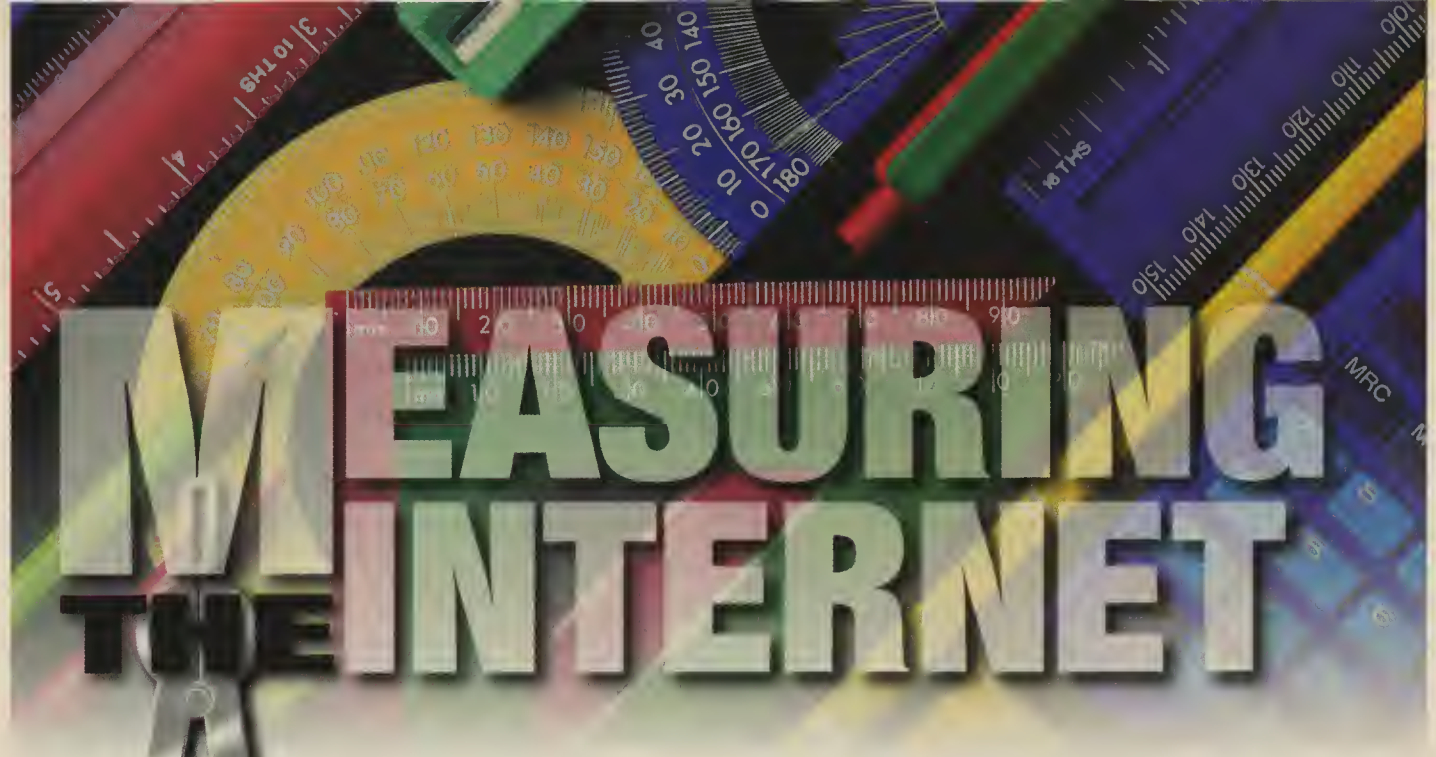
CONCLUSIONS

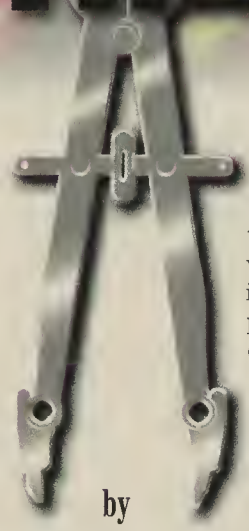
Of the two systems, the Whistle InterJet is broadly more polished, offers more features, and better accomplishes the mission of connecting a small business to the Internet. By packaging the product with ISP accounts, Whistle has taken much of the pain out of setting up a basic small office LAN connection. Features such as the built-in Ethernet hub, battery backup, and the web mirroring feature make this one of the most interesting packages we've played with in years.

Apexx's TEAM Internet lacks this polish. But once configured, it offers improved performance and with multiple users sharing a 33.6 Kbps connection, you need all you can get. It is more attractively priced, and offers some serious potential for Internet service providers who might want to take a few of these and customize them themselves for their customers to basically accomplish the Whistle trick but more specifically customized to the particular ISP's existing network. The Linux kernel will be familiar to many.

With either product, we think Internet service providers can tap into an entire market segment more profitable than the **$20** dial-up account, and more numerous than the standard 1.544 Mbps T-1 connection. Even better, these boxes allow them to upgrade customers to faster ISDN connections or even Frame Relay with little in the way of configuration changes later as their small business customers discover more and varied uses for their Internet connection. ◆



MEASURING THE INTERNET



by Jack Rickard

It is true that the Internet is a seriously complex interconnection of, at this point, tens of thousands of networks. Our next issue of the ***Directory of Internet Service Providers*** will likely diagram some 30 national backbones in the United States. One problem of such complexity is that it makes measurement somewhat difficult. It's not so much difficult to measure as it is difficult to develop fair measurements that are empirically capable of duplication. And almost any measurement developed immediately raises a ballyhoo of detractors attempting to prove that it doesn't prove anything.

The problem is that this line of reasoning has gone entirely too far. There apparently is little in the way of a truth ethic emerging online. We believe it has to do with the fact that a lot of very newbie people have entered the industry at all levels, and have confused measurement difficulty with some concept that measurements aren't available at all. This leads to some continual embarrassments here at ***Boardwatch.*** We have hardware vendors making preposterous claims with straight faces, ISPs making similarly outrageous claims, and everyone becomes extremely angry when we don't take their information at face value and print it. Actually we DO take quite a bit on faith, and repeatedly find later that it just wasn't true. Some days it seems the entire Internet is becoming one vast game of liar's poker.

While empirical measurement equipment is not available, there are some simple tools you can use to compare things in a relative sense. Whether they are definitive as to the produced number is not terribly important. You can compare the results between two service providers, backbones, web sites, etc. and get a pretty good idea of where the better connection is, and how various parts of the network work relatively.

We recently had an xDSL equipment vendor in the office making some pretty profound claims as to data rates etc. and anxious to demonstrate this over about 12 feet of copper. We got the connection up very quickly, and threw up a little utility titled *TcpSpeed* that does a very simple measurement by beating up a web site for twelve seconds and measuring the average throughput. The vendor was shocked that such a thing existed and immediately began explaining why it couldn't be accurate. How could he know it couldn't be accurate? He didn't even know what it was.

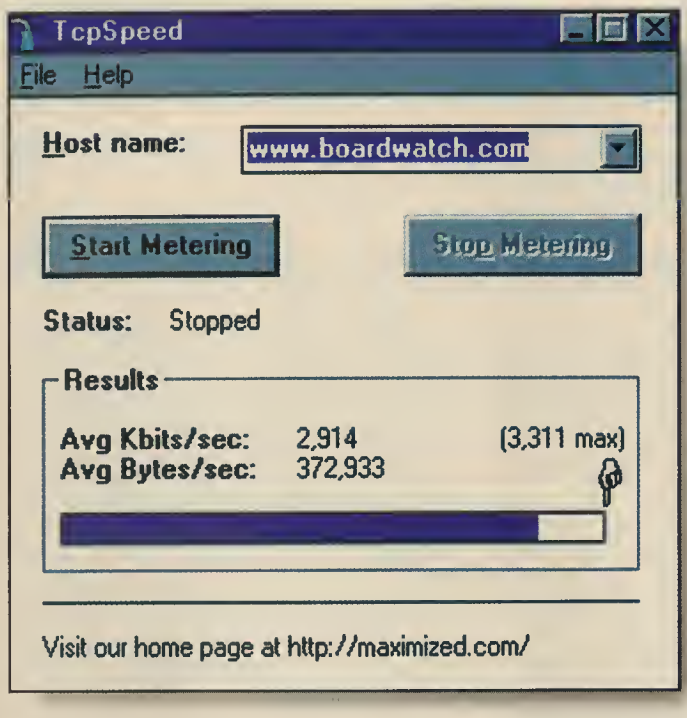
In any event, the xDSL product was indeed a pumper delivering over 1.8 Mbps as best we could tell. If it HAD done it over 18,000 feet in the ground as claimed, it would undoubtedly be the cover story this month. Unfortunately, of course, we found that it worked much better at the 12 foot length.

But we were surprised that he hadn't brought any software to prove the data rate, and further surprised that he found TcpSpeed to be such magic. Worse, we had a local Denver area ISP in the shop slurping coffee on the same day and HE nearly detonated after seeing the program. What if this stuff got in the hands of uninformed users....

From my point of view, it should be in the hands of anyone with an interest. I thought it was. It doesn't quite merit a story. It's a tiny little utility titled *TcpSpeed* developed by a company called *Maximized Software*. It's only 38 Kb in size and it's free at `http://maximized.com/freeware/tcpspeed/welcome.htm`. Maximized Software does a series of paranoia-ware programs designed to keep people from stealing your precious web site graphics and files. It works well enough, and simply enough, that it really hasn't been through much of an evolution. They put out ver-

sion 1.00 and it worked. Everyone complained, so they upgraded it to 1.01 and there it has remained.

TcpSpeed simply hits a web site and downloads data as fast as it can for 12 seconds. It measures how much data it gets second by second, and calculates an average data rate in Kbps and bytes-per second. A typical 33.6 Kbps modem connection will deliver about 75-80 Kbps of apparent data bandwidth. This is because the modems compress data using the V.42bis data compression algorithms, and the text on most web pages is very compressible. But it is trivial to connect to a local ISP's dial-up port, hit a couple of well known web sites such as `www.sprint.com` and `www.jpl.nasa.gov`, and take a few readings for example. If you then try the same procedure on ANOTHER dial-up port on a different ISP, you can compare the results.



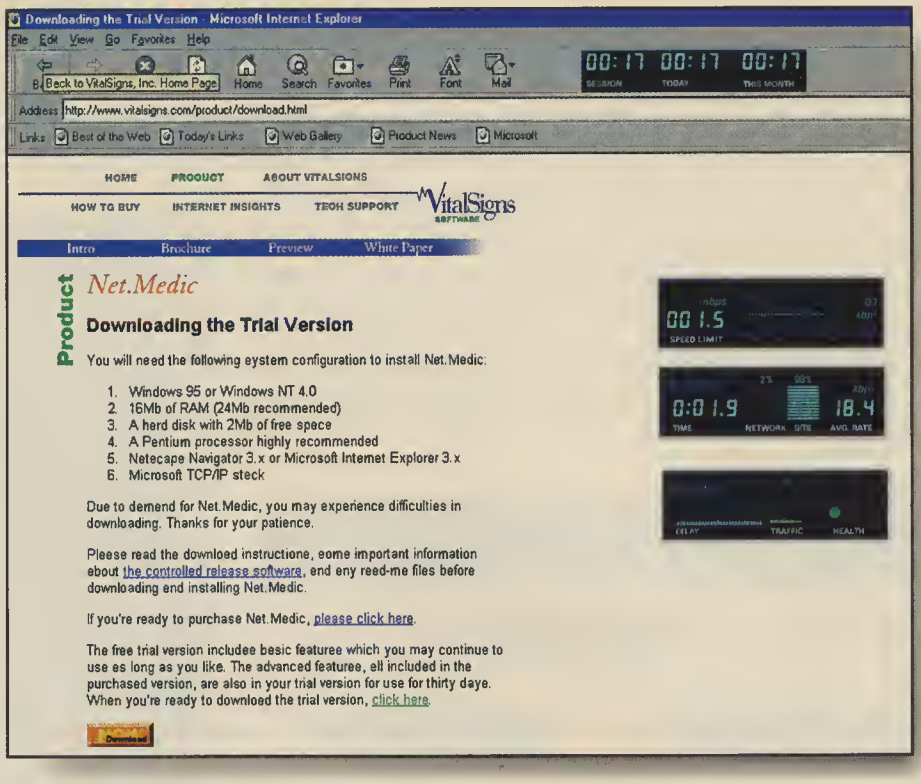
There are many things that can affect the results. One ISP might have more people on at the moment. It might use different kinds of remote access servers. Or it might have different size pipes to the backbone. Or it might just be connected to different backbones. WHO CARES? At the end of a long string of variables is an end user with a modem. One will invariably be faster than the other. Often, it will be consistently faster. Not all ISPs are created equal.

On a 1.544 Mbps T-1 connection, many users are surprised to see 400-600 Kbps of data rate using this utility. The 1.544 Mbps is the maximum data rate the line between you and the ISP can carry. It can be full of other things. The router at the ISP can be busy. The link from the ISP to the backbone can be busy. The backbone can be busy. And what we find over and over is that the web servers just can't push data that fast to multiple simultaneous users. But this is really not as alarming as it might seem. In the *Boardwatch* office, we get about 3 Mbps across the room on a 10 Mbps Ethernet after everyone here has gone home. That appears to be how networks work. The only problem with TcpSpeed is that it doesn't work on all web servers. Often, you have to hunt around for a server on a particular network in a particular city.

NET.MEDIC

A more advanced tool has been produced by VitalSigns Software. It is titled *Net.Medic* and it retails for **$49.95**. But free beta copies are currently available for download at `http://www.vitalsigns.com`.

The program is much larger than TcpSpeed, about 866 Kb, and involves an installation process. It works with your browser and so it has to find them and hook into them to work. It doesn't appear to work with the latest Netscape Communicator beta.



Net.Medic provides a much more advanced series of measurement tools. It looks for all the world like an Internet dashboard loaded with gauges and instruments. So much so, that while we like to play with this program, we haven't found it terribly useful — surprisingly. It purports to measure where problems are, including on your PC, the modem connection or local LAN, the ISP, the network as a whole, or the web site. VitalSigns has published a white paper on their web site that is comical marketing drivel, so there really isn't much public information on what or how this program does anything. The panel is sufficiently crowded that it can be difficult to derive useful numbers from any one test.

But it is loaded with geegaws. Basically, you select a web site and download some pages. The meters indicate how long it takes to download, how much was downloaded, the average Kb of bandwidth, and lists where the delays are. Again, we find them on the web server side most of the time.

The program has some impressive display options. The dashboard resides in the system tray of Windows 95. So you can overlay the dashboard as you download. But you can also break off specific panels by right-clicking on them and either float them over the browser display, or "snap-on" the panel onto the browser itself. The snap-on function is a bit small for us to read much, but the floating panels are actually quite useful.

It also keeps data cumulatively on your Internet sessions and produces some detailed reports that are much more useful. We found it both consistent and fascinating that the program, almost without fail, found fault with both our desktop machine and most consistently the web servers we contacted. Network problems were of relatively low incidence. On a typical evening session, 77 percent of the problem was indicated as a web server delay with about 20 percent of the difficulties being in low memory or other delays on our own desktop computer. The program offers a dozen different types of historical reports that are considered "advanced features." After a 30-day trial you must register the program at the **$49.95** price to continue to use them.

The program covers both LAN and modem connections. In truth, we just haven't gone through the learning curve enough to make use of it much in our daily work. But it is a lot of fun to play with.

KEYNOTE PERSPECTIVE

Building a web site isn't precisely a hobby or game any longer. The network is becoming a central part of some areas of commerce and for some companies the web site becomes a key entry in their success. As a result, a lot of time, effort, and resources are going into web design.

Increasingly, the task of designing a web site that might get 50 visitors this week, or perhaps 1.5 million, is looking impossible. So rather than build the hardware and connectivity in house, most companies are having the site hosted on a major Internet service

:-) ISP buys a network access server.

:-| ISP finds NAS not all

:-O ISP's customers don't always get fast,

:-(ISP can't promise users stability

(:-< ISP pulls all the hair out of his head.

:-D ISP hears about Shiva's award-winning

;-) ISP gets Shiva, grows hair back and

http://www.

it's cracked up to be.

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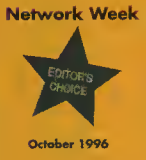
1994

1994

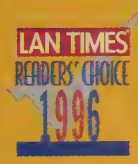
Commended

1995

1995

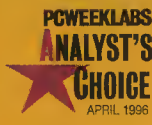


October 1996



1996

LanRover



1996

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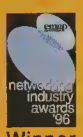
Best Remote Access Product

Best ISDN Product

April 1996
LanRover/E Plus



Remote Access Product of the year

January 1997
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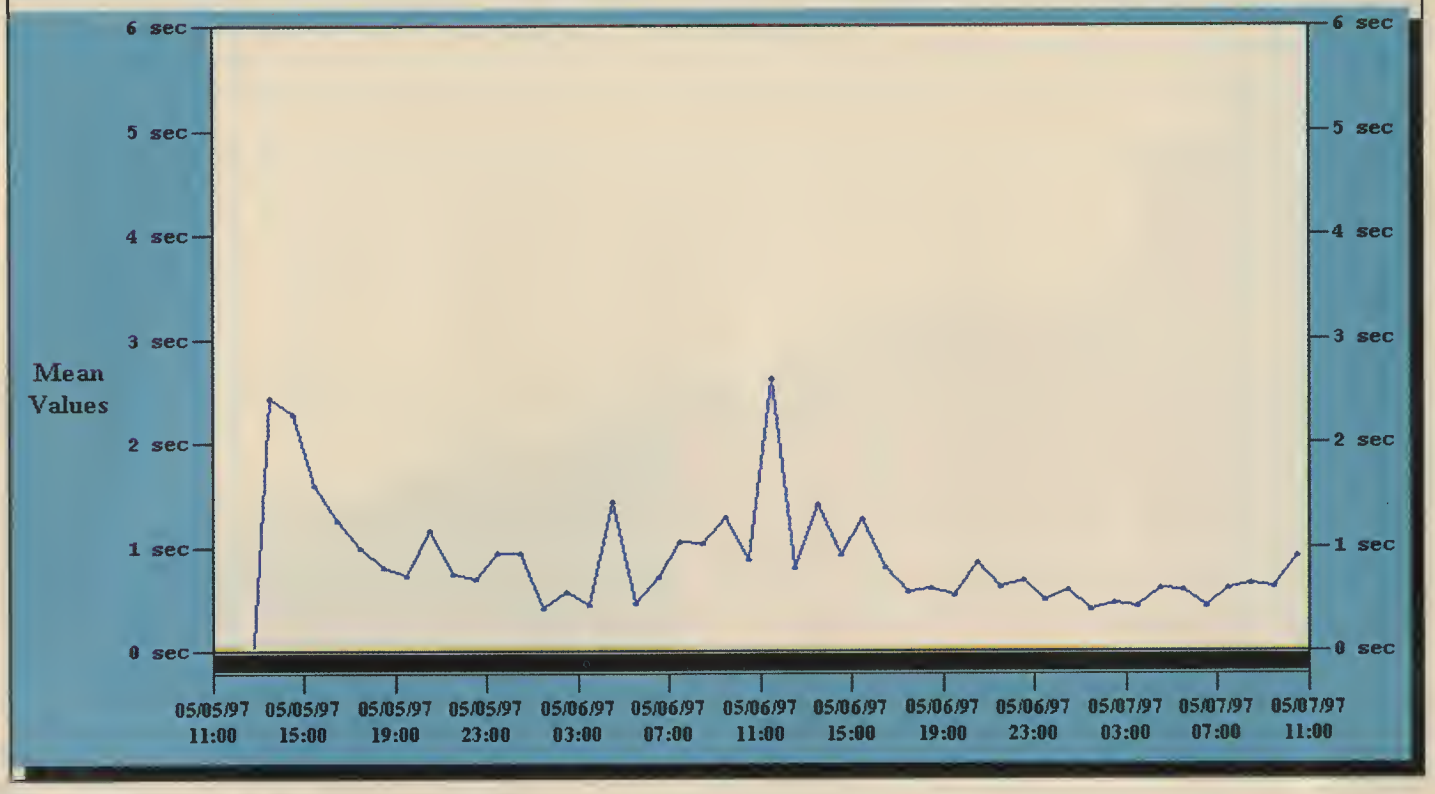
KEYNOTE INDEX

http://www.boardwatch.com



provider or national backbone operator. These companies are doing boom businesses in hosting web sites, and by spreading the traffic among a couple of hundred different web sites, they can put them all on large iron with 45 Mbps or better connectivity.

The problem is that ALL of the major hosting companies tout their networks and hosting systems as absolutely the best, the fastest, the most beautific in all respects. If you ask them to show you, they will generally talk a great deal about how they built it. They might also talk a bit about how satisfied you will be once you are on it. But they don't offer any actual data, studies, or performance figures. Selecting one is generally a leap of faith with little data.

Worse, after you have selected one, it can be difficult to tell how you're doing. The web site might look great from your location. But how does it look from New York City, or Dallas? And, does it work as well if you are a dial-up user on BBN Planet or PSINet or better from a UUNET or Sprint location?

A company called *Keynote Systems* in San Mateo, California has developed an ambitious, and we think fascinating approach, to finding out. It is called PERSPECTIVE. They are deploying a system of AGENT systems located in 96 different cities, connected to various backbones, in an attempt to roughly mimic the distribution of Internauts across the U.S. with regards to both geographic location and backbone connection.

The agents are aimed at any particular web site and poll the web site as often as every five minutes or as rarely as on the hour, depending on customer preference. It downloads the textual part of the web page and times how long it takes to transfer the data. The timing information is aggregated across the month and from all of these agents into a largish SQL database.

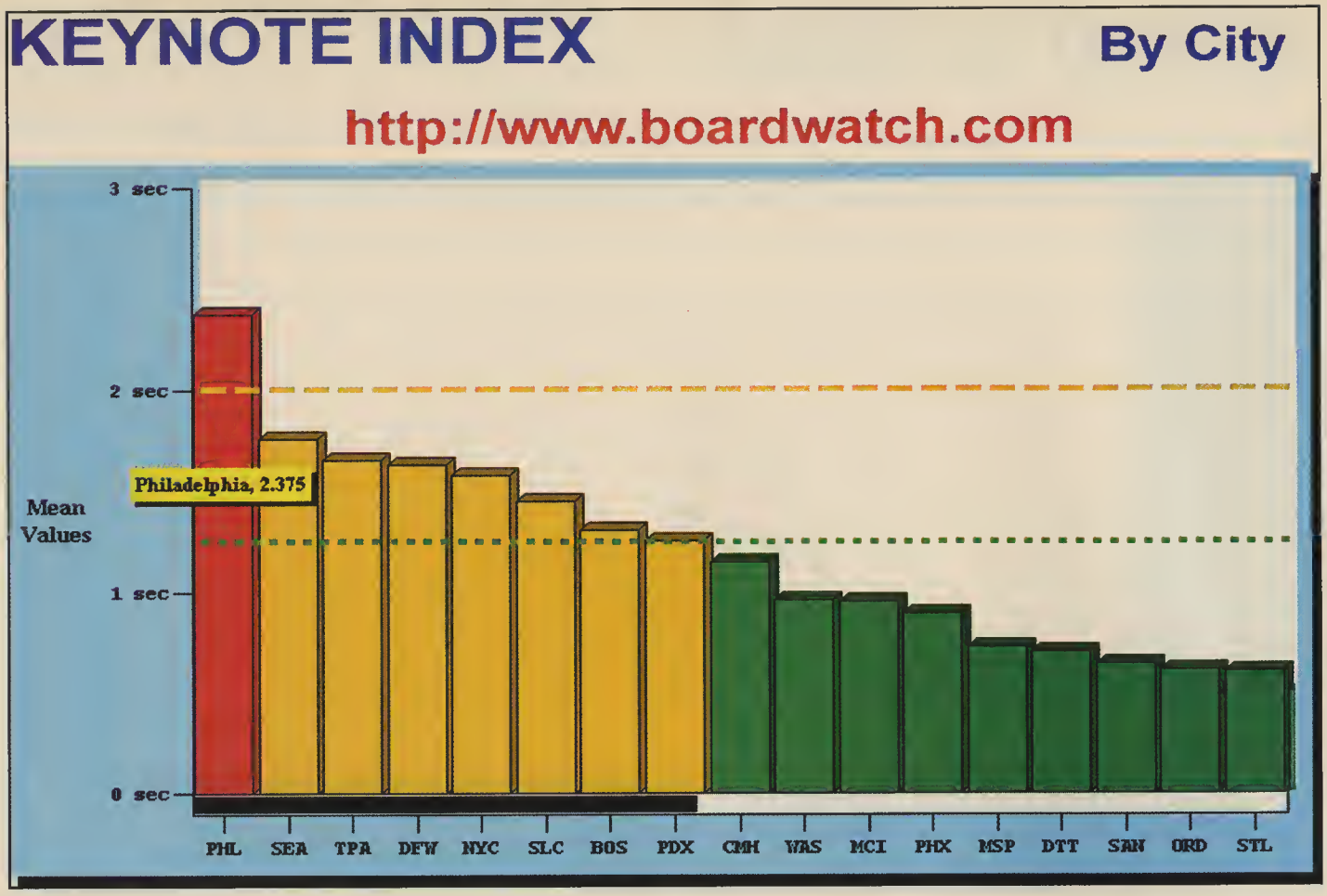
The customer uses a desktop Java application titled Keynote Professional Desktop to access the database and display various performance graphs. For example, one graph shows access for each day of the month with a data point representing an average of download times from each sample throughout the day, and that averaged with the average times from each of the agents to develop an accessibility time for that day. The 30 days of the month are then graphed. The result basically shows how long it takes to download your page across the month. There is a surprising amount of variation. And it basically represents an access matrix from across the Internet.

Another graph shows the average download times from each location. In this way, you can see that you're looking pretty good from Dallas on internetMCI, but Pittsburgh on BBN Planet is sucking pretty hard. This is a series of bar graphs with an initial code under each bar. But if you put the cursor over any particular bar, it displays the full city name and the average download time across the data set.

A scatter map of the U.S. shows each location as a green dot (good to go), yellow dot (some problems) or red dot (sloooowwww).

The company makes their Professional Desktop software available on a free 30-day trial at `http://www.keynote.com`. A data set is kept on 40 major business web sites across the country, such as the *Wall Street Journal*, that you can use to develop various graphs, monitor real performance, and play with the software.

The company currently has 28 agents operational and plan on a total of 96 in



the U.S. by the end of the year with further expansion plans to locate agents all over the world.

The service is not exactly cheap. It can run from **$700** or so per month up to several thousand dollars depending on how many agents and how often you would like them to sample your own web site. But it is a fascinating methodology that probably more accurately represents the "footprint" of a web site than anything we've seen anywhere.

An example of the service used for promotional purposes is the Keynote Business 40 Index. This is a selected set of 40 major web sites that they monitor continuously. In averaging the index, they derive a number representing the average download time of a page across the 40 web sites. For the week of April 21st to 25th, this was 19.88. The previous week it was 15.25. If this trend continues, a web page will take several hours to download by sometime in late August.

The Keynote Business 40 Index is published in *InfoWorld* and the *Wall Street Journal*. Its magic is the massive averaging. They are currently taking samples every 15 minutes, 24 hours per day, 30 days per month, and averaging that. But they are doing it, currently from 28 different agent locations, and averaging THAT. And for the Keynote Business 40 Index, they are doing ALL of that for 40 different major web sites, and averaging THAT. Minor anomalies just don't survive all that averaging.

We're utterly fascinated with the service. So much so that we've partnered with them to do something a little bit different. The current ***Directory of Internet Service Providers*** lists some 29 national backbone operators — each claiming to be the ultimate network. Coincidentally, almost all of them are also touting web hosting services pretty hard these days. We assume they would expend their very best efforts on their OWN web sites. This is probably not precisely true, but it certainly should be. So we've partnered with Keynote to continuously measure all of these backbone operator home sites. We're then going to publish both the city graphs and the time graphs for every one of them in each issue of the directory. In this way, we hope to provide a bit of a performance comparison for those shopping for a web host, or for that matter for a network connection.

And just to show that we're not above it all, the first one we'll measure is our own. The accompanying graphs show the bad news about `http://www.boardwatch.com`. We're not doing too badly — except for Philadelphia. Apparently, you have to suck on the pipe pretty hard to get any *Boardwatch* in Philly.

Despite the fairly significant price for measurement and the sunny commercial prospects for the service, we found the people at Keynote to have a genuine shared interest with the *Boardwatch* team — improving the network. We don't think it will get better in a world where anyone can make any claim they like in an ever escalating game of liar's poker. Competition is great, but if no one can tell a better product when they are in the room with it, they're not likely to get a better product in the end. We think Keynote's program is the most rigorous measurement metric we've seen proposed anywhere. And it will ultimately effect the network in very positive ways for years to come.

On the more pointed topic of improving your own web site, contact Keynote Systems, Inc., Two West Fifth Avenue, San Mateo, CA 94402; (415) 524-3000 Voice; (415) 524-3099 Fax; `http://www.keynote.com`; MailTo: `info@keynote.com`. ◆

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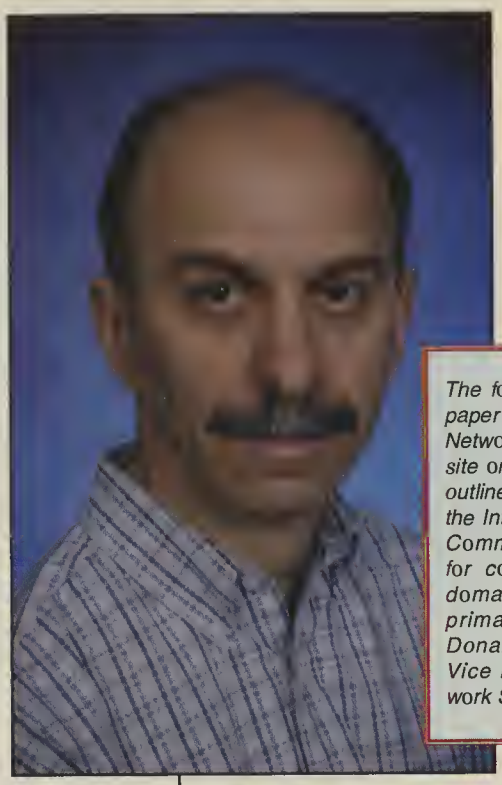


SECURE INTERNET Administration and Competition in DOMAIN NAMING SERVICES

The following is a white paper that appeared on Network Solutions' web site on April 17, 1997. It outlines an alternative to the International Ad Hoc Committee's proposal for competition among domain registries. The primary author is Dr. Donald Telage, Senior Vice President of Network Solutions.

Dr. Donald Telage, Senior Vice President of Network Solutions

As the Internet strives to obtain the same level of stability and cohesiveness as other global communication systems, the performance of certain key administrative functions have become the subject of debate. The most critical of those functions are essential to the stability of the Internet, and need to be performed on an integrated basis. The balance of these functions could be performed by multiple parties in an open competitive environment without jeopardizing the future of the Internet.

In this paper, Network Solutions, Inc. presents a comprehensive, consistent and practical concept for Internet administration:

1.) It proposes an integrated approach for secure administration of the key functions of the Internet. These are the management of the top-level routing databases, the allocation of dwindling Internet Protocol (IP) numbers, and the assignment of important network identifiers. The performance of these functions needs to be consolidated in a single integrated entity or organization.

2.) Domain naming services are identified as an administrative service that will benefit from enhanced competition. A model for creating that is presented which will result in increased investments in the Internet, greater choices for Internet users, expanded offerings, and reduced prices for basic services.

3.) Lastly, this paper proposes a realistic structure for the transition of management of all of these functions and services through appropriate, yet unobtrusive, government oversight. This proposed structure provides a badly needed stabilizing sponsorship for all of these Internet administrative functions and services that is required by the growing number of business (and individual) users of the Internet.

THE ISSUE—THE INTERNET IN TRANSITION

The Economist (October 19, 1996)

"The growth of the Internet has been the most astonishing technological phenomena of the last decade of this century. In 1990 only a few academics had heard of it; now, anything up to 50M people use it. In a year's time, that figure could be 100M—so far the network's only constant has been that the number of people tapping into it has doubled every 12 months. If it is to become a commercial success, ... it has to change. Otherwise many of the qualities that brought it popularity will become liabilities."

Communications Week International (January 20, 1997)

"The debate about domain names is likely to be the last-and therefore the most significant-for the "old" Internet. Once the supply of domain names goes commercial there will be nothing left to debate..."

"So the present hue and cry over domain names represents more than just a difference of opinion about a few details. It signifies the end of the old Internet and the arrival of the new. Subconsciously, this is what the debate is really about."

As noted by The Economist, there has been an exponential growth in the number of individuals using the Internet. What is not noted is the massive parallel investment made by corporations, large and small, in the Internet for commercial purposes. Whole market segments now depend almost completely on the reliable and assured operation of the Internet for their very existence.

The insights expressed by Communications Week International, although somewhat extreme, reflect the emotion that permeates the topic. This emotion must not be allowed to cloud our thinking. It is true that the recent phenomenon of substantial business investment in the Internet for commercial purposes, and the business community's growing reliance on the Internet as a commercial medium, are inconsistent with the informal volunteerism that supported the

network's early development and permeates it now. It also is true that these same volunteers, whom we all owe a tremendous debt of gratitude, shaped and guided the Internet through its birth and adolescence. They will continue to provide the technical leadership in the future from universities, government agencies, and businesses, large and small. However, if the future success of the Internet is defined by its stability and continued expansion, then its underlying administration must be properly structured and sponsored by appropriate authority.

Further, the major Internet administrative functions must evolve from government-funded research and development activities to enterprises supported by commercial investment. The success of this approach has already been demonstrated by the commercial evolution of the backbone, transmission systems, and access services.

This progression to more structure and to commercial funding, however, is counter to the long-standing culture of the Internet, and will be resisted by some simply on principle. To a relatively small percentage of the total number of Internet users, "profit", the "market" , "commercialism" and "sponsorship" are held in disdain. They fear that such change will destroy the Internet. We are convinced that they are mistaken. Change is inevitable, and we believe that it is only through appropriate market economics, and stable governance that the Internet will thrive and reach its full potential.

What major Internet functions and services are at issue, what is their current status, and how should each of them evolve? Under what structure would they best prosper? These are the questions that we attempt to answer in this paper.

BACKGROUND— GROWTH DEMANDS CHANGE

For some years, the single point of authority for Internet names and IP numbers and network identifiers has been the Internet Assigned Numbers Authority (IANA) operating out of the University of Southern California (USC) Information Sciences Institute (ISI). This is currently a four person operation led by Dr. Jon Postel, who has been its director since its inception. (The entire community is indebted to Dr. Postel for his pioneering work.) Throughout this entire period, the IANA has made all decisions concerning the Domain Name System (Domain Name System) and numbers, albeit at the perceived consensus of the "Internet Community." During this period, the IANA has issued more than 200 exclusive franchises to Internet name registrars around the world. This system worked reasonably well while the volume of registrations was very small and the Internet was non-commercial.

The end of 1994 brought the beginning of real growth on the Internet. With the rapidly increasing number of users registering for domain names, some of the registries began to impose user fees. On September 14, 1995, the National Science Foundation (NSF) authorized the imposition of user fees for the registration of second-level domain names within the .com, .org, .net, .edu, and .gov top-level domains in the operation known as the InterNIC. In addition to domain name registration, the fees support other critical Internet administrative functions performed by the InterNIC. These are:

- Online Internet Information Services for new Internet users worldwide
- Worldwide online lookup service for domain names
- Administration of Internet Protocol (IP) numerical addresses for the Americas
- Management of the .us top-level domain
- Operation of one of the nine root-zone servers worldwide
- Receipt and review of applications for all new top-level domains and implementation of them, following IANA approval.

The imposition of user fees was deemed necessary to fund the administrative support required by the explosion in the number of commercial Internet users registering directly in these top-level domains (TLDs). User fees were implemented on the advice and consent of the NSF. This decision was vehemently opposed by longtime users of the Internet, who had become accustomed to receiving government-subsidized Internet functions and services. Internet name and IP number registrations, information services and directory services had been supplied free of user fees by a series of U. S. government-funded contracts awarded pursuant to the NSF in 1992.

Network Solutions, Inc. (NSI), performed without charge all of these functions and supplied all of these services through a competitively awarded contract with the NSF. (NSI is the only TLD registry to operate under a government contract, and the only registry which had to compete successfully to receive its franchise.) After NSI's cost plus government contract with the NSF was amended to eliminate the government subsidy and converted to a user fee-funded approach, NSI became the target of much of the criticism. NSF personnel will privately acknowledge that the commercialization of this activity was critical to the survival of the registration service. NSI's major investment in personnel, hardware and software, and communications systems has allowed these functions and services to keep pace with the triple-digit annual demand for growth in domain name registrations over the last two years. Registrations have risen from less than 200 per month to more than 95,000 per month in less than two years reaching 1.2 million as of this writing. In spite of this growth, these private investments by NSI have allowed the InterNIC to reduce the timeline for registration from approximately four weeks to less than 24 hours. This is a strong example of the power of private investment and commercial incentive to produce enhanced services.

Recently, increasing numbers of registration service organizations for top-level country domains have imposed similar annual user fees. The imposition of user fees typically corresponds with improvements in service. Many of these registries are "for-profit" concerns which charge considerably more than the registration fee currently charged by the InterNIC even though they only supply a fraction of the services. Further, registries such as co.uk, under the United Kingdom TLD, blur the distinction between ISO 3166 country codes and "generic" TLDs. The domain co.uk is, in actuality, a "generic" TLD for commercial companies headquartered in the UK. The ISO 3166 country code for Great Britain is .gb. Like .us, it is not yet extensively used.

This situation, however, appears to be changing. Even though still subsidized by NSI, commercial fees have been introduced into the .us TLD in the last year. Aspiring entrepreneurs have received (and continue to receive) from the IANA exclusive franchises to register .us domain names in selected geographic regions of the United States, each charging fees that each deems appropriate. Further, this new commercialism has generated dozens of new creative businesses, which supplement and expand registration services. For example, NetNames, as a service bureau, registers domain names for businesses in over 190 countries for a one-time fee. In another example, NameSecure will do a name lookup and reserve available names for their clients. These are just two of the many examples. Numerous companies are entering the market for name reservations and registration.

ONE VIEW OF THE FUTURE—THE IAHC

In an effort to increase the number of TLDs with international scope and to introduce more competition into the registration of Internet names, the Internet Society (ISOC) assembled a group of 11 individuals to form the so-called International Ad Hoc Committee (IAHC). On December 19, 1996, the IAHC began a dialogue with the Internet community concerning the future direction of domain name registration which culminated with the issuance by IAHC on February 4, 1997 of its final proposal. This paper is NSI's response to the final IAHC proposal and offers an alternative vision of the future. It should be noted that NSI strongly supports the introduction of enhanced competition in domain naming services. We believe the introduction of additional TLDs should be accomplished in a way that creates greater worldwide investment, expanded service offerings, and more choices for Internet consumers.

The final IAHC proposal raises a number of important issues for full discussion in a much wider circle (especially the business sector, which was not consulted). Already, the IAHC and the Internet Society have been named in a legal suit to enjoin them from implementing their proposal. Should the proposal move forward, more challenges are sure to come. For those unfamiliar with the proposal, we feel it is defective on five key points:

1. The IAHC proposal does not provide the incentive for TLD registrars to invest in improved services. In calling for "shared TLDs" and geographic market restrictions, the IAHC proposal will curtail the development of a truly competitive environment, and will dilute the effectiveness of market forces. The IAHC proposal does not recognize the need for market branding in the commercial world. Legitimate corporations will not invest time, stockholder capital, and other resources in "shared" brands.

2. The proposal risks the fragile stability of the Internet. The IAHC proposal is too complex to succeed. It calls for an immediate shift to international administrative control by Internet-inexperienced and currently non-existent organizations. It unnecessarily increases the likelihood of failure of the administrative functions and services of the Internet. The development of a reliable North American shared database in the administration of telephone numbers took years. Introduction of shared name registration in the near term is destabilizing. Stability is the critical factor in the growth of the commercial Internet. Proposed changes need to reflect this reality.

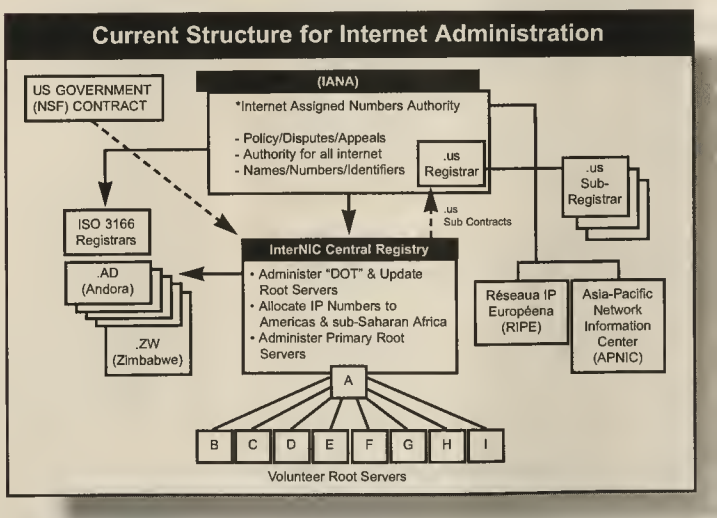
3. The IAHC proposal approach is too bureaucratic. The IAHC fails to recognize and trust the ability for market dynamics to proliferate and improve services. It is not a pro-competition proposal; it is an attempt to establish a multi-source, extremely regulated environment for the administration of a small subset of existing TLDs. A multi-layer bureaucracy is not justified.

4. The proposal is narrow and does not address the total situation. While detailed in its discussion of a small subset of the hundreds of currently existing TLDs, the IAHC proposal remains silent on the three truly critical functions of Internet administration: the allocation of IP addresses, the management of Internet identifiers, and the administration of the "dot" (the root of the TLD structure and the global servers that support it). These three functions are fundamental to any discussion of Internet address administration, and they require neutral oversight, management, and control. (See Figure 1 for the complexity of the current administrative structure.) Further, the IAHC proposal does not even address the vast majority of the currently existing Internet TLDs, many of which are commercial. It is selective and specifically aimed at NSI.

5. The IAHC proposed approach to domain name disputes appears unworkable and will create increased conflicts. The IAHC proposal is overly-ambitious, and assumes that Internet domain name disputes can be dealt with through goodwill and online arbitration. Simultaneous registration of domain names by multiple global registrars will create a global litigation nightmare. The technology for simultaneous time-stamping of registrations for 28 global registrars operating in the same domains will add an enormous dimension to the dispute problem. The IAHC proposal jeopardizes the progress made in stabilizing and managing the explosive growth without providing any tangible benefits.

The problem of domain name disputes on the global Internet cannot be adequately resolved by an arbitration body lacking international or at least national judicial authority. The dispute problem requires a body of international law or, at least, civil procedure, that is specifically applicable to domain names and trademarks. Ask the question "Which body of trademark law will govern the online arbitration contemplated in the IAHC proposal?" and observe the thundering silence. Trademark owners world-wide will continue to sue in court for their rights as they have always.

We applaud the IAHC for their initial proposal, but we encourage expanded discussion. NSI, and many others, have concluded the IAHC proposal cannot be supported as proposed. The IAHC proposal differs substantially, and deeply, from what we believe is necessary for the Internet to change and to flourish. The IAHC, which holds no legal authority, has proposed a plan which threatens the speed and stability of Internet registration, and offers a complex new bureaucracy without introducing effective competition. The IAHC proposal does not even discuss IP allocation or administration of the "dot". The IAHC proposal is based in regulation and control. Our industry-driven plan is based in free market competition.



FIVE GUIDING PRINCIPLES FOR NSI'S PLAN

We have set forth a short set of guiding principles to broaden the discussion to encompass all of the important issues. These principles enhance competition and are necessary to secure and safeguard the key functions of the Internet.

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1. LIMIT REGULATION

Domain name registration should be driven by the marketplace and commercial interests; it should not be unduly regulated. It has been demonstrated time and again that an unregulated or limited regulatory approach is the most cost effective and eliminates the need for publicly-funded or artificially-funded regulatory structures. No other approach will encourage investment in registration and ancillary services with the same intensity. Under this approach, the customer, not a governmental bureaucracy, is king, ensuring the highest levels of service and service offerings. Customer demand creates a built-in incentive to generate improvements in service, the development of additional services, and the most creative solutions to evolving problems. The non-regulatory approach also offers the only possible funding model through which the level of service can expect to meet the level of demand.

2. LIMIT BUREAUCRACY

Domain name registration is not, and should not be, a "public trust" managed by newly created, bureaucracies. The notion that TLDs or second-level domain names are a "public trust" is based on a number of misconceptions. It is assumed that second-level domain names are a limited commodity that, unless somehow regulated, will run out. This assumption is unfounded, as the number of second-level domains in each TLD is, for all practical purposes, limitless (37 to the power 26). Even the number of short domain names is significant. There are more than 25,000,000 second-level domain names of a length 12 characters or less in each "generic" TLD for each person on earth (approximately 4 billion). We should not confuse the potential domain name space with such concepts as "radio spectrum," with its inherent physical limitations. What we are actually discussing are appealing monikers, which have the powers of brand identification, and in certain instances have legal trademark implications.

Under our vision, TLDs (and second-level domains) will be developed as brands by competitors entering the Internet. Internet entrepreneurs and Internet end users must be allowed to decide the selection of TLDs. There is no need to limit the number of TLDs, or pre-select the TLDs themselves. In fact, market forces, not committees, should determine the most desirable brands. TLD branding and ownership, not bureaucracies, will foster increased choice by Internet consumers and increased investment by TLD providers.

3. MINIMIZE REQUIREMENTS

Any requirements for competition for the administration of TLDs (and second-level domains) should be minimized. All who meet minimum technical and financial criteria should be allowed to become a registrar. Random drawings, "lotteries", or restrictions on the number of registrars to administer TLDs is bureaucratic, overly regulatory and contrary to market competition. While such a proposal may appear "fair," it will not generate what is best for Internet end users. Allow anyone with the minimum capabilities to apply to become a registrar. Those who wish to compete should present their qualifications, become a registrar, and allow the market, not a lottery, to select the most capable or cost competitive providers to survive. The Internet should benefit from, not repeat, the lessons of history. As demonstrated in the now abandoned lottery process which created huge arbitrage windfalls for cellular franchise winners, these schemes are unfair.

4. PROTECT CRITICAL FUNCTIONS

The administration of the "dot", its associated servers and the allocation of IP addresses create the present stability of the Internet. In contrast to the registration of domain names, these critical administrative functions must be managed in an integrated and cooperative manner.

The "dot":

The root of the Internet, referred to as the "dot", and the root servers connect domain names and IP numbers on the Internet. Together, the "dot" and its root servers represent the means by which a registrar of one TLD locates and connects with a registrar of another TLD, thus enabling the global Domain Name System to function. For the Internet to be connected and function, there can be only one "dot" and one set of root servers. (Future technology advances may change this, but not in the foreseeable future.) The "dot" and root servers must be managed in a neutral, cooperative, and integrated manner. The management of the "dot" and its associated servers must respond to the needs of its constituency, namely all the registrars for the various TLDs around the world.

IP Number and Internet Identifier Assignment:

IP address space is limited and consequently must be allocated on an as-needed basis. Unlike domain names, IP addresses are exactly analogous to "radio spectrum." Further, because of the technical realities of routing over the Internet, allocation must be carried out in a manner that preserves the "route-ability" of allocated addresses. This process is highly technical, and is governed by policies and procedures that consider the actual architecture of the Internet at any given point in time. IP allocation also must be managed in a cooperative manner. Correspondingly, the management of IP address space must respond to its constituency, namely the Regional IP Registries, the Internet Service Providers (ISPs) and Internet Access Providers (IAPs), as well as other major commercial users of IP address space.

5. ESTABLISH LEGAL SPONSORSHIP

The administration of "dot" and its root servers and the allocation of IP numbers and Internet identifiers need to be anchored in a sponsoring legal authority which provides both legal protection and stability. It is no longer appropriate for these functions to be performed by volunteers.

The current, growing crisis of authority in Internet administration needs to be faced squarely. For some years, the Internet Assigned Numbers Authority (IANA) has supplied leadership in this area. The source of the authority of the IANA is poorly understood. Perhaps the best way to explain the role of IANA is to say that the IANA has "historical authority" in matters related to Domain Name System and IP number assignment on the Internet. The growth of commercial interests in the Internet, and the flurry of recent lawsuits threatens to destabilize, if not dismantle, the present structure. The functions of IANA must be transferred and firmly anchored in an official, and impartial, granting and sponsoring authority. Any viable proposal for the Internet must address this issue.

THE INTERNET: A SECURE FUTURE WITH COMPETITION & CHOICE

This paper proposes a feasible implementation for proper administration of the "dot" and IP number allocation, and an unregulated, competitive environment, one driven by commercial investment realities for registration services. It is a draft and critical evaluation and refinement is invited. It is offered in the spirit of generating informed discussion to secure the best outcome for the

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Internet. The underlying administrative functions of the Internet are important components of the system. A wrong decision now will affect the Internet and its potential for years to come.

The following plan recognizes the realities facing the Internet today, acknowledges the United States' historical and continuing leadership role in the medium, retains as much of the current process as reasonable, and adheres to five guiding principles outlined in the previous section. Finally, the plan, as outlined, is rational and easily implemented. The key points in the NSI proposal are:

Transition the important functions now performed by the IANA to a legal authority.

Eventually, the functions of the IANA need to be anchored in some international legal authority. It is our opinion that no such organization exists at this time. To allow the time to transition, and to establish the charter for such a sponsoring organization is envisioned, an interim sponsoring organization.

A branch of the U. S. Government (perhaps a Federal Advisory Committee) would assume interim authority during a two-year transition period. The functions performed by the IANA relating to the "dot", IP numbers, and network identifiers must be institutionalized, and managed in a way that transcends individual personalities. burden of Internet decisions, and the potential legal exposure, are too great for any one person, or small group. This approach would allow a stable period of transition for public input and new processes to develop and mature structures. It is not unreasonable that the sponsorship of the U. S. government continue through these turbulent times.

The Internet was primarily developed and funded by the U.S. Government and Research Community. Although the Internet has become a global communication medium, the U.S. government underwrote the development of the Internet both technically and financially for more than 20 years.

In this case, a small amount of government sponsorship acts as a significant and stabilizing anchor for the activity. The growing number of legal actions surrounding the issue of legitimate, legal authority demands such sponsorship. Who has the authority? From where does the authority derive? These questions are being asked more frequently in knowledgeable circles.

Select a contractor to manage the "dot" and its root servers.

The importance of the "dot" to the functioning of the Domain Name System also requires neutral, stable management. A competitively selected contractor to manage the "dot" would provide accountability and stability. This contractor should:

- Manage the "dot" and establish a set root servers for the "dot" worldwide, which may be actually managed by several other contractors to limit vulnerability;
- Operate services pertaining only to the data related to the "dot";
- Maintain the data, updates and top-level directories for the "dot";
- Establish the minimum technical and financial requirements for TLD registrars, including both worldwide TLDs and the ISO 3166 country TLDs
- Authorize the creation of new TLDs and their addition to the global Domain Name System.

Allow all interested parties, who meet minimum criteria, to compete in TLD registration.

Theoretically, there is no technical reason why the number of TLDs needs to be limited. There can be as many TLDs as there are second-level domains. The following approach is proposed:

- All interested parties meeting minimum requirements would be allowed to compete in the TLD registration business.
- Specific, individual, and exclusive TLDs would be proposed by each registrar, and would be issued on a first-come, first-served basis (with some limitation, e.g. 3 per registrar);
- Each registrar would deploy and operate servers to support their own specific TLDs where they deemed appropriate, or contract this service from others; and
- All TLD registrars would be assessed fees, based on business volume, to support the Domain Name System managing contractor.

Registrars would establish their own operating procedures, including second-level domain name dispute policies, marketing, service standards, and collateral services consistent with their own brand identity for their own TLDs. Consumers could then select from among widely differing and competing concepts and price/service offerings. Competition will drive the services offered, quality, pricing, contract terms and other discriminators between registrars. Registrar databases would be proprietary.

These proposed procedures eliminate the unnecessary complexity of the IAHC proposal, encourage investment by participating registrars, and guarantee an increase in efficiency and customer service.

Establish three new Regional IP Registries to supplement RIPE and APNIC.

The Regional IP Registries would continue to provide oversight for the management of IP address space and its allocation within their respective regions. The current proposal to establish three new IP registries ARIN, AfriNIC, and ALyCNIC should be accelerated. They are required to provide complete global coverage. Each regional IP registry should:

- Allocate IP address space to ISPs and others in its region;
- Maintain all data relative to its regional IP allocations;
- Manage and assign inverse addressing (IN-ADDR) and Autonomous
- System Numbers (ASNs) within its region; and
- Manage the root zone servers established within its region.
- Continue to assess individual ISPs reasonable user and membership fees.

CONCLUSION

The importance of the issues presented in this paper cannot be over emphasized. The changes for the structure of the Internet which are suggested here are fundamental. Decisions on them will, in essence, define the stability, growth and shape of the Internet for decades to come.

Unfortunately, the vast majority of Internet users are oblivious to the facts and these concepts. As a result of its position in the Internet, and its pioneering role in commercializing registration services, Network Solutions has a unique vantage point. It is our intent that this paper will educate the uninformed, and spur the uninvolved without alienating any group. It will take the combined skill of the entire Internet community to craft solutions that lead to the best path to the future. ◆

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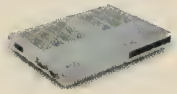

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Phillip J. Lawlor, President and CEO of AGIS

Internet Backbone Operator Finds Itself KNEE DEEP IN HOT SPAM

by Bill McCarthy

Phillip J. Lawlor never realized that selling bandwidth could be so controversial. You'd think the man was selling abortion on demand rather than space on national electronic pipes. Lawlor, the president and CEO of Apex Global Internet Services, Inc. (AGIS), is at the center of a shrill debate over commercial Internet e-mail and newsgroup postings that at times seems every bit as menacing as if he ran an abortion clinic.

The Dearborn, Michigan-based company and its leader face the Net equivalent of an angry mob over the issue known on the Internet as *spam* with some making threatening suggestions such as "Death to AGIS" in public newsgroups and a few making harassing and threatening phone calls to his home. Lawlor's home telephone number, his home address, his fax number and the e-mail address he uses for customers have been posted by anti-spam activists for the world to use.

Lawlor says a vocal minority on the Internet of about 40 or 50 people "call in the middle of night; they disrupt my family life." He is concerned about the safety of his wife and children. Lawlor said he refuses to respond in kind: "I'm a business person and I'm not going to succumb to terrorism, but I am going to solve the problem."

AGIS is responding by proposing an industry-wide trade association to promote ethical bulk mail practices. The watchdog organization would work to prevent commercial e-mail abuse. Bulk e-mailers would be required to join the organization to purchase Internet connections from AGIS. The company said it has enlisted cooperation from other network operators, as well. AGIS would provide a web site where those who do not want commercial e-mail can enter addresses on a global remove list that association members must honor or lose connections. "We think we have found the middle ground," Lawlor said.

Anti-spam activists, such as Robert Braver, are skeptical, however. Braver said that global remove lists have been disingenuous in the past and that "spam factories" maneuver around them.

A MATTER OF ATTITUDE?

Why is Lawlor a target? "It's interesting. I don't have an answer to that. It might be a little bit of false courage. It's easy to sit behind a terminal and attack somebody anonymously," Lawlor said. A number of considerations have entered into policy decisions. "Most important to me are our customers," and some customers have contracts preventing AGIS from interfering with e-mail activity. Federal law plays a role, as well, Lawlor said. Investors in the privately held company that maintains 200 points of presence and projects $40 million in revenue for 1997 also have a say.

A survey of postings on newsgroups such as news.admin.net-abuse.usenet and news.admin.net-abuse.email indicates the word went out that Lawlor was the person responsible for the AGIS policy, the person who could change it, and for what anti-spam forces perceive as an uncompromising attitude about spamming. AGIS said it refused to take a "Big Brother" stance by monitoring or censoring its customers' business practices, and that its position has been that the Internet is an open marketplace where commerce of any and all kinds may take place in accordance with public demand.

Anti-spam activist Scott Hazen Mueller said, "AGIS is hot because they're the only US national backbone provider with no anti-spam policy whatsoever. Everyone else (ANS/AOL, CompuServe, UUNET, MCI, Sprint, Digex and BBN) has taken a stand and terminate even dedicated-line customers who spam." Hazen Mueller and others associated with Fight Spam on the Internet!, **http://spam.abuse.net/spam**, said the group does not condone the type of personal attack that Lawlor has experienced and pro-

vides information about the proper methods for protesting spam.

SECRECY FUELS SPECULATION

Nor does the group condone illegal acts such as the April 17th "concentrated and systematic attack on its Internet backbone network" that AGIS reported to the U.S. Justice Department and the Federal Bureau of Investigation. An attack, the company says, brought down its Washington DC point of presence for the better part of a day, causing routing problems across the Internet. Little is known about the attack. But for two days prior, the company reported on its web pages (`www.agis.net`) routing "instability" and "difficulties" at its Washington POP; problems the company also reportedly corrected. The prior routing problems, the spam controversy and the lack of available information have created rampant speculation, however.

Hazen Mueller said, "I don't think any well-known anti-spammers are behind it—the attack, that is. I'd imagine it's probably some hacker with a grudge, probably over spam, but not necessarily. AGIS is a rogue site (see `HTTP://spam.abuse.net/spam/rogues.html`) and in theory the almost 4,000 supporters of the campaign are all shunning AGIS." Four thousand is the number of people who signed up at the Fight Internet Spam! site to resist or protest spam, he said.

No one is talking about specifics of the attack. Special Agent Dawn Mortiz of the FBI's Detroit field office said that the bureau received information from AGIS, but that the agency will not reveal the nature of that information. She could not even confirm that the FBI is investigating.

"I still can't address that," Lawlor said, when asked about the attack and the subsequent rumors that include a hacker attack, a technical error by an AGIS employee, and another backbone operator configuring routers to block spam off the AGIS network. He believes the attack is unrelated to the spam controversy, however. All Lawlor can say is: "AGIS will be vindicated." The company will provide the information when the investigation is completed, and it is an interesting situation with "public intrigue" that ISPs will find useful. Lawlor said the FBI and the Justice Department "doesn't share their information with us."

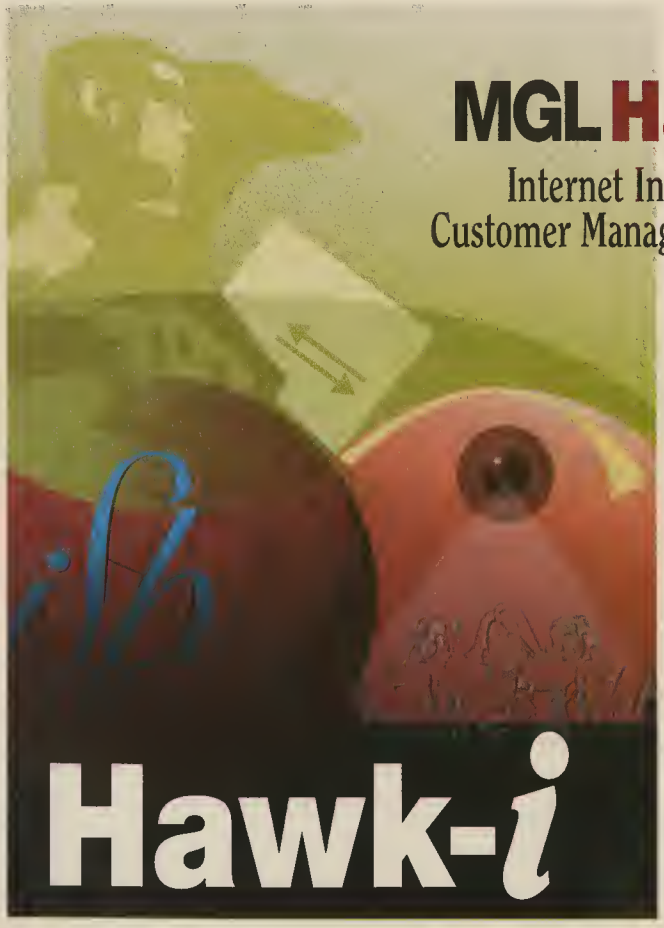
No private information was compromised, and AGIS engineers worked around the clock to correct problems and increase security, the company said. But until details are released, AGIS will likely remain the focus when technical glitches hit the Net. When a router at Virginia-based MAI Network Services turned packets into lemmings marching into cyber oblivion on April 25, speculation again focused on AGIS, for example. Routers transfer packets across the Net based on the Border Gateway Protocol (BGP), which is broadcast to other routers, alerting them to the routes available for data. The router in question lied to the huge network hub at MAE East in Washington DC, announcing that it was the best way for all packets to get anywhere on the Net, luring millions of packets to their deaths. Selling bandwidth is a complex business in a world where anyone with a router, enough BGP knowledge to be dangerous and a connection to the Internet can wreak havoc for millions of cyber travelers, but in the Spring of 1997, AGIS will likely get the blame in the rumor mill.

MONEY MATTERS

Well before the routing misfires, Lawlor said, AGIS began searching for an answer to the controversy. During an AGIS-sponsored, two-day summit with the CEOs of companies that produce commercial e-mail, Lawlor said: "I found them to be much different than I expected. They don't want to send e-mail to people who don't want it." The commercial e-mailers want sales. "We live in a commercial world; everybody needs to make a buck," Lawlor said. And the bottom line is that "someone is buying."

"Do I think spam is bad? I receive several offers a week, 20 or 30 phone calls," he said. His U.S. Post Office box overflows with commercial mail. "It's aggravating, but it's a non-issue because there isn't any way to stop it." Some people want the discounts offered and major companies have chosen to advertise in that manner, Lawlor said. "It's a legitimate way to reach out."

And *reach* is a key word, especially when coupled with price. EMail USA advertises on its web site (**http://mass-email.com**) that it will pump your ad into 100,000 e-mail boxes for **$100**, 225,000 e-mail boxes for **$200**, or 500,000 e-mail boxes for **$450**. There's no rain, nor snow, nor dark of night to impede your sales pitch, and people who open their mailboxes have to look at it. But that's also the rub; those people may decide your offer warrants retaliation rather than sales receipts. Not to worry, though, not only will EMail USA mail your ad, but the Secaucus, New Jersey,



company absorbs venomous responses, "leaving you with positive results. Something that slow, do it yourself methods cannot do." Nearly anyone selling anything can come up with the money for an advertising campaign.

A national direct snail mail campaign with automated addressing, however, costs 18.3 cents a letter for third class mailing. If the addressing is not automated, you're looking at 25.6 cents a letter. Design, printing and so on, not included. If you mail in one small geographic area the cost drops, but nowhere close to under a penny per letter like the EMail USA deal. And you'll consider yourself lucky if 2 percent respond, even luckier of a fraction of those respondents buy.

Someone is buying on the Net, though; Cyber Promotions owner, "Spam I am" Sanford Wallace, claims his company is making enormous profits. Interestingly, a traceroute to the Cyber Promotions web page puts the Pennsylvania-based company on the AGIS backbone, while a traceroute to the EMail USA site puts it on the Digex backbone. No doubt, much of the AGIS controversy has to do with the man who enjoys being called *Spamford* and his in-your-face self-promotion. Cyber Promotions' web page invites complaints to the media, lawmakers, and suggests it be blamed for the actions of others because "we profit from controversy." Wallace said he has a contract with AGIS: "Our relationship will not end anytime soon."

Robert Braver said that Wallace has "always gotten the boot" when other ISPs received complaints, and AGIS seems a bit "disingenuous ... just in the way they're going about doing things."

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Wallace is a key component of the animosity toward AGIS, and why the anti-spam forces have a difficult time believing that a global remove list will work. "If he only wants sales," Braver said of Wallace, "then why does he spend all his time and money getting around people who don't want to get junk e-mail?"

Braver believes that most of the material that is offered by e-mail is in the vein of get rich quick schemes, phony "health" products, and pornography—ads trolling for suckers and degenerates. Those with legitimate products and services who use such e-mail services are new to the Internet and later regret it, Braver said.

Wallace said he honors requests for removal, his business is legal and the e-mail origins are hidden because of attacks by anti-spammers. "I think Phil Lawlor is one of the brightest people on the Internet. He's taken a problem and created an opportunity instead of just complaining," Wallace said.

Braver published "Implementing Warnings for AGIS Netblocks," a collection of CGI scripts at **http://spam.ohww.norman.ok.us/default.htm** that webmasters can insert in their sites so that anyone from an AGIS network connecting to a page on the site would receive a warning message instead of the page's actual contents. The warning alleges that AGIS provides bandwidth to spammers, so some sites and networks may restrict access from their machines.

Wallace has drawn hackers as well. Crackers broke into Cyber Promotions' web site in March and posted passwords among newsgroups. Wallace said the passwords were useless, but also claims to have reported the incidents to the FBI. Since the FBI is allowed to operate in secret on such issues, however, none of this is verifiable.

Net lore expert and anti-spam campaigner J.D. Falk said: "People are getting so frustrated with e-mail spamming right now that they're saying all kinds of things—and some are even doing all kinds of things, like the person or persons who cracked into Cyber Promotions' web server. While I certainly can understand the frustration, two wrongs don't make a spammer repent."

And the crackers who popped Spamford's server along with the rumors of anti-spam hackers attacking AGIS do not help the campaign, but bolster stereotypes of radical ideologues who are anti-electronic commerce. Falk says, "I think the whole commercialism aspect is just a straw man that Canter & Siegel made up as an excuse for their actions. I've been an anti-spam activist since the days when Canter & Siegel were a threat, and we keep seeing that exact same argument from every spammer who comes along." Laurence A. Canter and Martha S. Siegel, a team of Phoenix-based attorneys, preceded Sanford Wallace in Net notoriety. They also published *How to Make a Fortune on the Information Superhighway* in 1995 and Siegel released an updated paper version called *How to Make a Fortune on the Internet* on April 1.

"See, among the most influential anti-spam folks, the vast majority of us are in no way anti-commerce. Never have been. Hell, if it weren't for the Net going commercial, I'd still be stuck in a dead-end job in cable access televison," Falk said.

Falk cites Fight Internet Spam!: "Protecting users from spam makes the Internet more conducive to commerce, not less. Employers are more likely to let their employees read Usenet at work if the newsgroups remain topical and functional. Using e-mail for business is much easier if mailboxes aren't clogged with extraneous material. People are much likelier to take Net commerce seriously if they don't think of the Net as a cesspool of scams, questionable products, and pyramid schemes."

SELF POLICING POLICIES

Most national providers said they have a policy, although the specifics of defining spam are not well defined. Some such as PSINet issued new policy statements in the wake of the AGIS controversy. Other Internet service providers such as GlobalCenter and MindSpring Enterprises have very strict definitions. At MindSpring, 15 commercial e-mails or 15 commercial postings to newsgroups can put your account in jeopardy; at GlobalCenter, 25 can bring the boot.

"You have to state what your opinion is out front. You have to inform people on what the policy is when they sign up," said Mike McQuary, president of MindSpring. "Additional bad behavior" such as responding to spam with a letter bomb will also get a subscriber tossed. McQuary also said: "I think anytime vigilantes are determining the fate of everybody, it's not right."

Little will likely be settled in the commercial e-mail debate anytime soon. One thing, however, is clear: Any ISP operator who thinks he can run a Pipes-R-Us business, is liable to find his phone ringing in the middle of the night. It could be over poor BGP scripting, then again it could be a death threat over the stuff that's being pumped through those pipes. ◆

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By Vito Echevarría

SOUTH AFRICA

THE INTERNET POWERHOUSE OF THE AFRICAN CONTINENT

If one were to gauge South Africa's presence on the Internet, one would marvel at how much the country has embraced the information superhighway. Numerous South African firms and industries — from South African Airways (`www.saa.co.za/saa`) to arms manufacturers Armscor (`www.armscor.co.za`) and Denel (`www.denel.co.za`), the Chamber of Mines of South Africa (`www.bullion.org.za`), and even *The Weekly Mail and Guardian* newspaper (`www.mg.co.za/mg`) have wasted no time in establishing a presence on the World Wide Web.

Perhaps such a trend shouldn't be surprising. South Africa is by far the most industrialized nation in the African continent, with a first world economy that the U.S. Department of Commerce recently pegged as a big emerging market for future U.S. exports of goods and services. Given its lengthy distance from many of its trading partners (USA, Europe, Japan), South Africans were compelled to go online.

Aside from such practical commercial reasons, South Africans see the Internet as a viable means to psychologically connect with, and be in-tune with the rest of the world. During the days of Apartheid, South Africa was treated as a pariah state and was isolated from the rest of the industrialized world. The country has recently gone through a transition from an Apartheid system to democracy.

SOUTH AFRICAN BUSINESS-RELATED WEB SITES

South African Chamber of Business
(`www.wna.co.za/sacob`)

This web site, which serves both South African and foreign businesses, provides an introduction to South Africa's investment environment.

The "Business Pulse" section has the latest news on South African business, including economic indicators, and the Chamber's own Business Confidence Index (BCI) — which is influenced by such factors as the South African Rand's exchange rate against the U.S. dollar, international gold prices, exports, and the unemployment rate.

The "Legal Corner" lists recent court decisions that affect companies doing business in South Africa, while the web site's "Parliamentary" section provides not only legislative measures that affect doing business in South Africa, but well-detailed information on the South African Parliament itself — including contact information on Premiers, Executive Councils, Speakers, Whips, and Members of Parliament.

In the "Labor Relations" section, local and foreign companies are advised of the labor laws— from minimum wages to collective bargaining, unemployment insurance, and safety in the workplace.

Cape Chamber of Commerce and Industry
(`www.ccci.co.za`)

This web site is for those U.S. and other foreign business people who are serious about hitting the South African market with their products. Of all the sections that prospective investors would find most interesting, the "International Trade Services" section may prove the most useful, since it lists the tools needed to maximize potential sales in South Africa — such as a trade opportunities bulletin, an import/export handbook, a trade database, and a business guide.

Another section, the "Exhibition/Trade Shows 1997," lists the various trade shows that foreigners should attend to increase South Africa-related sales, such as the Computer Faire and Bexa Cape '97 shows, the Agricultural Show, the Consumer Electronics Show, and the Retail Africa '97 show.

Johannesburg Chamber of Commerce And Industry/JCCI
(`http://africa.cis.co.za:81/jcci`)

Representing 4,500 South African companies of all sizes, the Johannesburg Chamber (JCCI) actively lobbies various sectors of the South African government to protect the interests of its members. Like its counterpart in Cape Town, the Johannesburg Chamber's web site has its own set of online resources useful for those interested in doing business in South Africa.

This web site's "Information" section, there are subsections dealing with product sourcing (for those who need to trace, for example, manufacturers of brand-name products), legislation (government gazettes, statutes, labor legislation and regulations, and taxation information that affects foreign trade), statistics (on South Africa's economy), and publications (providing JCCI members with various trade directories and journals, reference books, and government publications).

Another relevant portion of this web site for American and other foreign business people is the "JCCI International Trade Contacts" section, where networking between South African entrepreneurs and their foreign counterparts is encouraged. For foreigners, the Chamber also sets up introductions to South African government officials, diplomatic and consular corps, and financial institutions.

Then there's the "Joint Venture Opportunity" section where foreign firms can browse potential joint ventures that they want to pursue with South African companies and investors.

For further information on the JCCI, send an e-mail to:
`jcci@cis.co.za`

SOUTH AFRICAN INTERNET SERVICE PROVIDERS (a sampling)

Given South Africa's intense need to increase contacts with more distant industrialized nations, it's no surprise that its number of ISPs is growing. At last count, there were nearly 40 South African ISPs. The following is a profile of some of them:

Le Club Internet Access Durban / LIA Durban
(`www.dbn.lia.net`)

LIA Durban is based in the Indian Ocean port city of Durban. LIA Durban also has customers in Johannesburg, Cape Town, Pretoria, Secunda, Newcastle, and Durban.

Services
Web access, e-mail, IRC, Telnet, shell account, 18-hour e-mail and phone support, value-added services like e-mail paging and roaming throughout South Africa and neighboring Namibia.

Pricing
Dial-up service is **US$17.00** per month for unlimited access.

Contact
Rob Fisher
Tel.: **(27)(31) 705-4767**
Fax: (27)(31) 705-2031
E-mail: `rob@dbn.lia.net`

Global Internet Access / GIA (`www.global.co.za`)

One of LIA Durban's larger rivals is Global Internet Access. GIA has POPs in Johannesburg, Pretoria, Cape Town, Durban, Port Elizabeth, East London, Bloemfontein, Welkom, Kimberly, Nelspruit, Selebe Phikwe. It also has a foreign access point in Gaberone, Botswana.

GIA, unlike other South African ISPs, also guarantees first time connections, or a free month of Internet service in the event of a busy signal.

Services
Web access, e-mail, Telnet, IRC 2 MB free web space for personal web pages, and free technical support between 8:00 a.m. and 11:00 p.m. seven days a week.

Prices
Dial-up service is **US$17.95** per month for unlimited access.

Contact
Global Internet Access
49 Wessel Road
Rivonia, Gauteng (Transvaal)
South Africa
Tel.: **(27)(11) 803-4024**
Fax: **(27)(11) 803-1434**
E-mail: `info@global.co.za`

Proxima Information X-Change/ PIX (`www.pix.za`)

PIX's customer base is nationwide: Johannesburg, Cape Town, Pretoria, Durban, Bloemfontein, George, Pietermaritzberg, Port Elizabeth, and Middleberg. PIX's service are similar to its competitors.

Services
Web access, e-mail, Telnet, IRC, personal web pages.

Prices
Dial-up service is **US$20.00** per month for unlimited access.

Contact
Konrad Michaels
Proxima Information X-Change
P.O. Box 84631
Greenside 2034
Transvaal, South Africa
Tel.: **(27)(11) 782-0800**
Fax: **(27)(11) 888-7196**
E-mail: `info@pix.za` or `konrad@pix.za`

Marques Systems (`www.marques.co.za`)

Marques Systems is located in the provincial town of Welkom (pronounced "Velkom") and provides services similar to LIA Durban. Marques Systems' customer base is within the Orange Free State (one of South Africa's provinces).

Services
Web access, e-mail, IRC, Telnet, and technical support between 8:00 a.m. and 10:00 p.m. Value-added services include e-mail paging, national roaming, and FTP caching.

Prices
Dial-up service is **US$24.00** per month for unlimited access

Contact
Stefan Schoeman
Marques Systems
Suite C, Heeren II, Heeren St.,
Welkom, Orange Free State,
South Africa
Tel.: **(27)(57) 357-1184**
E-mail: `stefan@marques.co.za`

SOUTH AFRICAN BACKBONE OPERATORS

SAIX (`www.saix.net/saix`)

This backbone operator is owned by the state-controlled South African phone company Telkom — which has a monopoly over the country's phone service. The following are SAIX's monthly rates:

Bandwidth	National Service	International Service
64 Kbps	US$1,045	US$4,024
128 Kbps	US$1,882	US$8,050
256 Kbps	US$3,973	US$16,100
512 Kbps	US$8,364	US$32,200
1,024 Kbps	US$16,272	US$64,400
2,048 Kbps	US$33,455	US$128,800

SAIX has 4.5 Mbps of international bandwidth (2 x 2 Mbps + 512 Kbps) that ultimately connects to Alternet in the United States. The 2 x 2 Mbps connection terminates in New York, while the 512 Kbps connection terminates at Washington, DC.

Contact
Bloemfontein: **(27)(51) 430-6281**
Cape Town: **(27)(21) 462-1852**
Durban: **(27)(31) 307-4305**
Johannesburg: **(27)(11) 462-8755**
Pretoria: **(27)(12) 326-3944**
E-mail: `queries@igubu.saix.net`

The negative realities associated with monopolies have caused a backlash from many South African ISPs. Ninety percent of South Africa's ISPs are members of the Internet Service Providers Association (ISPA) (`www.ispa.org.za`). Many are taking their litany of grievances, from pricing to inadequate service, concerning Telkom and its backbone SAIX to the country's Competition Board. These grievances may be irrelevant now as ISPs have other options for their backbone connection needs.

The Internet Solution (`www.is.co.za`)

A competitor of SAIX, The Internet Solution has POPs in Johannesburg, Pretoria, Cape Town, Durban, Port Elizabeth, Bloemfontein, Paarl, and Winhoek, Namibia). The following are the Solution's monthly rates:

Bandwidth	Setup	Monthly
64 Kbps	US$1,250	US$1,534
128 Kbps	US$1,250	US$3,068
256 Kbps	US$1,250	US$6,364

International Backbone Connections

Type	Speed	Destination/ Service
Satellite	1.544 Mbps	Boston, USA/BBN
Satellite	1.544 Mbps	Boston, USA/BBN
Fiber Optic Cable	1.544 Mbps	Washington, D.C./Sprint
Satellite	1.544 Mbps	Washington, D.C./Sprint

Contact
The Internet Solution
P.O. Box 3234
2121 Parklands, Transvaal
South Africa
Tel.: **(27)(11) 447-5566**
Fax: **(27)(11) 447-5567**
E-mail: `info@is.co.za`

UUNET Internet Africa (`www.iafrica.com/iafrica`)

This backbone operator claims to have the largest subscriber base in South Africa (24,000 customers in October 1996), with corporate customers such as Standard Bank, Gencor, and the Pick 'N Pay supermarket chain. Cities covered are Bloemfontein, Cape Town, Durban, East London, Johannesburg, the Boland area, Pietermaritzburg, Pretoria, and Stanger. As illustrated in its backbone map (`www.iafrica.com/iafrica/localweb.html`), UUNET has a 2 Mbps connection between Johannesburg and UUNET International in New York, a 512 Kbps connection between Johannesburg and RGnet in Oregon, and a 2 Mbps connection between Cape Town and UUNET in Virginia. The following are UUNET's rates:

Bandwidth	Service	Setup	Monthly
64 Kbps	variable rate	US$1,477	US$864
64 Kbps	fixed rate, low use option. Up to a maximum of 100 MB incoming international traffic	US$1,477	US$1,250
64 Kbps	fixed rate, high use option. Up to a maximum of 1 GB of incoming international traffic	US$1,477	US$1,773
128 Kbps	variable rate	US$1,477	US$1,364

Contact
Cape Town: **(27)(21) 689-6242**
Johannesburg: **(27)(11) 803-1365**
E-mail: `info@iafrica.com`

South Africa, one of the ISPs complained, doesn't have enough total bandwidth to adequately cover its growing Internet activity. Although improvements in South Africa's telecom structure are in the works, it's likely that such upgrading will not keep up with the demands that neighboring African states will likely make on the Internet. The fact is that neighboring southern African states (such as Namibia, Mozambique and Zimbabwe) have just scratched the surface of their Internet-related needs, and South Africa will probably act as the hub for future Internet traffic between Africa and the United States.◆

WIRELESS Data Development

by Steve Stroh

HAMVENTION '97

By the time you read this I will have returned from "RF Nerdvana," the annual Dayton Hamvention (`www.hamvention.org`). Held on a long weekend each year in late April to mid-May at the Hara Arena near Dayton, Ohio, amateur radio operators take over Dayton and West Central Ohio much like the computer industry takes over Las Vegas for Fall Comdex. Hamvention is total immersion in all things amateur radio. Dayton is the amateur radio industry, and individual amateur radio operators' equivalent of Comdex. Where the comparison between Comdex and Hamvention breaks down is the flea market. Literally, there are acres of electronic flea market. Some of it radio, much of it not, but all entertaining—everything from WWII surplus radios to Cisco routers. I've seen at least one of every piece of non-custom equipment that I've ever touched in my electronics and computing career at Hamvention. In a future column, I'll follow up on what I saw at Hamvention that's relevant to the ISP industry, especially in low-cost wireless data communication.

Steve Stroh learned wireless TCP/IP networking as an Amateur Radio operator (callsign N8GNJ). He's one of the founding members of the *Puget Sound Amateur Radio TCP/IP Group* and is Secretary for *Tucson Amateur Packet Radio (TAPR)*, a national not-for-profit amateur radio research and development corporation that specializes in wireless digital communications.

Professionally, he's a NetWare and Windows NT administrator for a large company. He's done battle with UNIX a few too many times and mostly lost, so now he's learning Linux and BSDi in preparation for his next UNIX challenge. Steve lives in Woodinville, Washington (in the shadow of Redmond) with wife Tina and daughter Merideth. He can be reached at `strohs@halcyon.com`.

FOLLOW-UP: AT&T FIXED WIRELESS TELEPHONE SYSTEM

In my April 1997 column, I described AT&T's Fixed Wireless Telephone System (FWTS) that was still in development, but looked quite promising. After the initial flurry of press releases and articles, a story in the March 10, 1997 issue of *Business Week*, "How AT&T Lucked Into A Wireless Secret Weapon," shed some new light on the development of the FWTS that I thought ***Boardwatch's*** readers would enjoy hearing. Apparently, the Fixed Wireless system originated within McCaw Cellular, which AT&T bought and renamed *AT&T Wireless*. The system was considered secret enough for McCaw to not reveal its existence to AT&T even during the buyout negotiations. McCaw did not want AT&T to know about the FWTS in case the negotiations fell through and McCaw would be going ahead with the project on its own. AT&T was told about the FWTS only *after* negotiations were complete. A team from Bell Labs, now part of Lucent Technologies, was sent to check it out, and apparently returned a pretty glowing report. Glowing enough, to gamble **$2 billion** on the then upcoming wireless auctions.

One of the reasons AT&T's Fixed Wireless Telephone System *is* so promising over other Fixed Wireless telephone systems is that AT&T has many of the parts of the system in place, including:

- Technology that really seems to work.
- Technology specifically tailored to the unique requirements of fixed wireless, rather than mobile wireless adapted for fixed use.
- Technology that provides data (at reasonable speeds) and voice.
- An established experience base with wireless communications.
- Near-nationwide allocation of the same band of frequencies (that won't conflict with its mobile wireless system).
- An established wireless system in place, with transmission sites where the FWTS base antennas and equipment can be added, not built from scratch.
- The ability to act as a competitive local telephone company, with name recognition on a par with the local telephone company.
- Superb marketing abilities.
- Deep, deep pockets for the development, marketing, and deployment phases.

AT&T could still blow this opportunity and squander this technology. But there is **$2 billion** worth of stockholder's money riding on frequency purchases in preparation for this system; that's a powerful incentive not to blow it. There are also a lot of very talented and motivated people working on this project, and apparently a promising attitude at AT&T for funding the development and investing in the brain power necessary to pull this off.

FOLLOW-UP: WIRELESS MODEMS SUITABLE FOR EXPERIMENTATION

In my May 1997 column I described two wireless data products which I felt were particularly appropriate for experimentation by ISPs that were interested in getting a taste of wireless data technology. I have a third system to recommend: O'Neill Connectivities Local Area Wireless Network (LAWNII) System (`www.ocilawn.com`). Like the FreeWave DGR products, LAWNII is a wireless equivalent of a null-modem RS-232 cable, with a few enhancements for being able to connect from a "master" unit to multiple "slave" units, and the ability to "repeat" through one or more units to extend the effective range of the connection. O'Neill's products have one compelling recommendation — lower cost. The performance isn't quite as high as that of the FreeWave or WaveLAN

units, both in throughput and range, but it's probably adequate to get a feel for the some of the advantages and limitations of Wireless Data.

THE GREED FOR SPEED... WIRELESS DEPARTMENT

Yeah, I've heard it many, many times. Wireless is cool, but you just can't do much with it, really, because it's so slow, at least compared to an Ethernet connection. Point taken...kind of. The reality is that once you start using a ubiquitous wireless system, you'll probably be willing to live without the raw speed that you think is an absolute requirement. It's hard to believe how handy it is to be able to browse the Web from a battery-powered laptop. For those of you that still think you need to have Ethernet speed for wireless to make sense, I have some good news—it's been a busy month.

Not to be outdone by its former parent company's fixed wireless telephone system announcement, Lucent Technologies on April 22, 1997 that it has developed, and patented, a new modulation technology called *DS/PPM* that permits wireless data transmission at 10 Mbps (Ethernet speeds). DS/PPM was developed at Bell Labs' Utrecht, Netherlands labs, which is devoted to wireless data networking, DS/PPM is intended for use in the unlicensed 2.4 GHz band. DS/PPM is based on the Direct Sequence mode of Spread Spectrum technology instead of the more common Frequency Hopping mode. Interestingly, DS/PPM will include compatibility with the emerging IEEE 802.11 specification for wireless local area networks. Lucent has a good grasp of Wireless Data technology, which is no real surprise since Bell Labs developed cellular telephone technology. But as I've mentioned previously, Lucent "inherited" the WaveLAN product line (`www.wavelan.com`) from its original developer, NCR, during the time when NCR was owned by AT&T. Lucent seems to be handling the WaveLAN product line fairly well, and this bodes well for the DS /PPM. Lucent will no doubt find a ready market for DS/PPM's speed advantages. Lucent's press release on this topic is at `www.lucent.com /press/0497/970422.bla.html`.

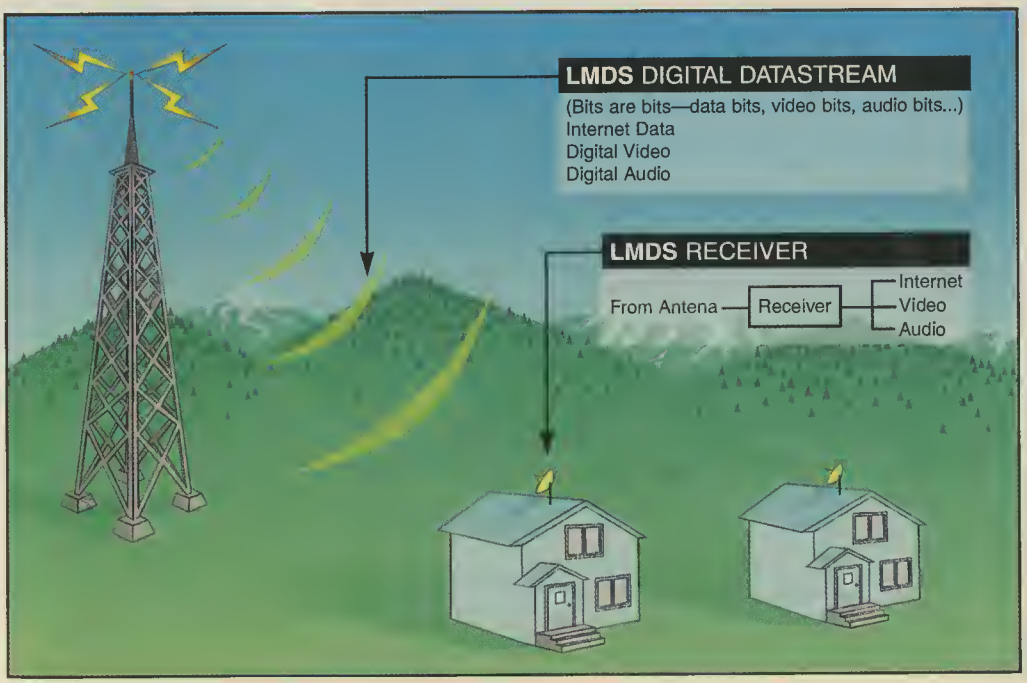
You may have heard of "wireless cable." Yes, it's an oxymoron. Wireless Cable's formal name is *Local Multipoint Distribution Service* (LMDS). LMDS has also been called *Multichannel Multipoint Distribution Service* (MMDS). LMDS never was all that well known (that I can tell), and in the last couple of years DirecTV, Primestar, and the Dish Network pretty well took over the "bypass the local cable company" market with their high quality signals, reasonable pricing, and the undeniable fact that "they *aren't* the darn local cable company." Which has kind of left LMDS as a service in search of a mission. The fact that LMDS has a huge chunk of spectrum—1.3 GHz—allocated to it hasn't escaped the notice of either the FCC or the wireless industry, and so it was somewhat inevitable that the LMDS band would be put up for yet another FCC frequency auction.

One of the more unusual features of the LMDS spectrum is that it was specifically intended, in its original form, as a direct-to-the-home band. Precedent is important when dealing with the FCC in wireless matters, so the fact that it has been OK with the FCC in the past to use the LMDS band to access consumers is very attractive to wireless companies. Historically, LMDS has been used as a broadcast band, using high powered omnidirectional transmitters and highly directional small dish antennas on the home. The excitement is that once the LMDS bands are auctioned off, the winning bidder can use the LMDS bands however they wish. This would include providing digital video, audio, and data services (allowing reception *and* transmission from the home), and conceivably, telephone and Internet services (quite possibly at 1.544 Mbps rates). Note that it doesn't look like the winning bidder would have to use the LMDS band to provide communications to the consumer market. Most likely, the winning bidder will own the LMDS band in a specific area. If it's more lucrative to start providing T-1 (or faster) Internet access to outlying areas from a central site, then that's probably how LMDS will be used. If it's lucrative to provide digital video "broadcasting," or "private digital video networking" (which may become likely once High Definition Television units begin appearing), then they will probably be provided too.

LMDS

Local Multipoint Distribution System

Illustrates the current ability to integrate an internet data stream into a digital bitstream transmission. Note that internet data can only be *received* wirelessly. User to internet communication still requires a conventional connection, i.e. modem, etc.



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CellularVision (www.cellularvision.com), WebCel (www.webcel.com), and CAI Wireless Systems (www.caiwireless.com/cai.html) are some of the companies that plan to participate in the auctions of the LMDS band, and have stated plans to offer high-speed wireless Internet services.

CellularVision claims to have been the first company in the world to deploy LMDS, and the first company to commercially offer telecommunications services over an LMDS or super high-capacity wireless system. CellularVision plans to offer Local Loop Bypass, ISDN, T-1, Internet, and "25 Mbps."

WebCel's mission is to become a leading provider of wireless broadband voice, data, Internet and video services to businesses and consumers. WebCel's lead investor is Softbank Holdings, Inc., which also owns Ziff-Davis Publishing Company, Comdex, and is working to acquire Kingston Memory.

CAI Wireless Internet Access (www.caiwireless.net/homepage.html) currently uses an asymmetric hybrid wireless system. Data from the user to the Internet are carried "out of band" by typical low(er)-speed wired connections— 56K Frame Relay, etc. Data from the Internet to the users are broadcast as part of the LMDS digital data stream (which also includes digital video signals). CAI's "New York City" type system transmits Internet data at 27 Mbps, while its "Rochester" type system transmits Internet data at 10 Mbps.

The LMDS band auction will obviously go to the highest bidders. That doesn't necessarily lock out small to medium-size Internet service providers from providing wireless services. Remember that late in 1996, the FCC authorized a 300 MHz of spectrum known as the *Wireless National Information Infrastructure* (W-NII) bands. Manufacturers will likely begin offering equipment for the W-NII bands by early 1998. The market for equipment to make use of the W-NII bands will be huge, so prices for W-NII equipment may begin to approach reasonable, making it possible for ISPs to use W-NII equipment to connect their customers to the Internet via wireless data.

RECOMMENDED READING

Where Wizards Stay Up Late : The Origins of the Internet, by Katie Hafner and Matthew Lyon. (Published by Simon & Schuster, copyright 1996, ISBN 06848 12010.) No, I don't take notes this precisely, I just looked it up on Amazon.Com. (www.amazon.com). I was fascinated with this book. It answered a lot of questions about why things on the Internet are the way they are, as well as providing lots of personal stories about some of those near-mythical figures of the Arpanet and early Internet. The explanation of the cut-over between the Arpanet and the Internet was worth reading the book just to learn the details of this major transition in the life of the Internet. Overall, this book provides context that will undoubtedly be valuable to anyone who deals with the Internet on a technical level. One of the lessons that the book details rather well is that that early technical contributions, no matter how fundamental, are no guarantee of future success. ◆

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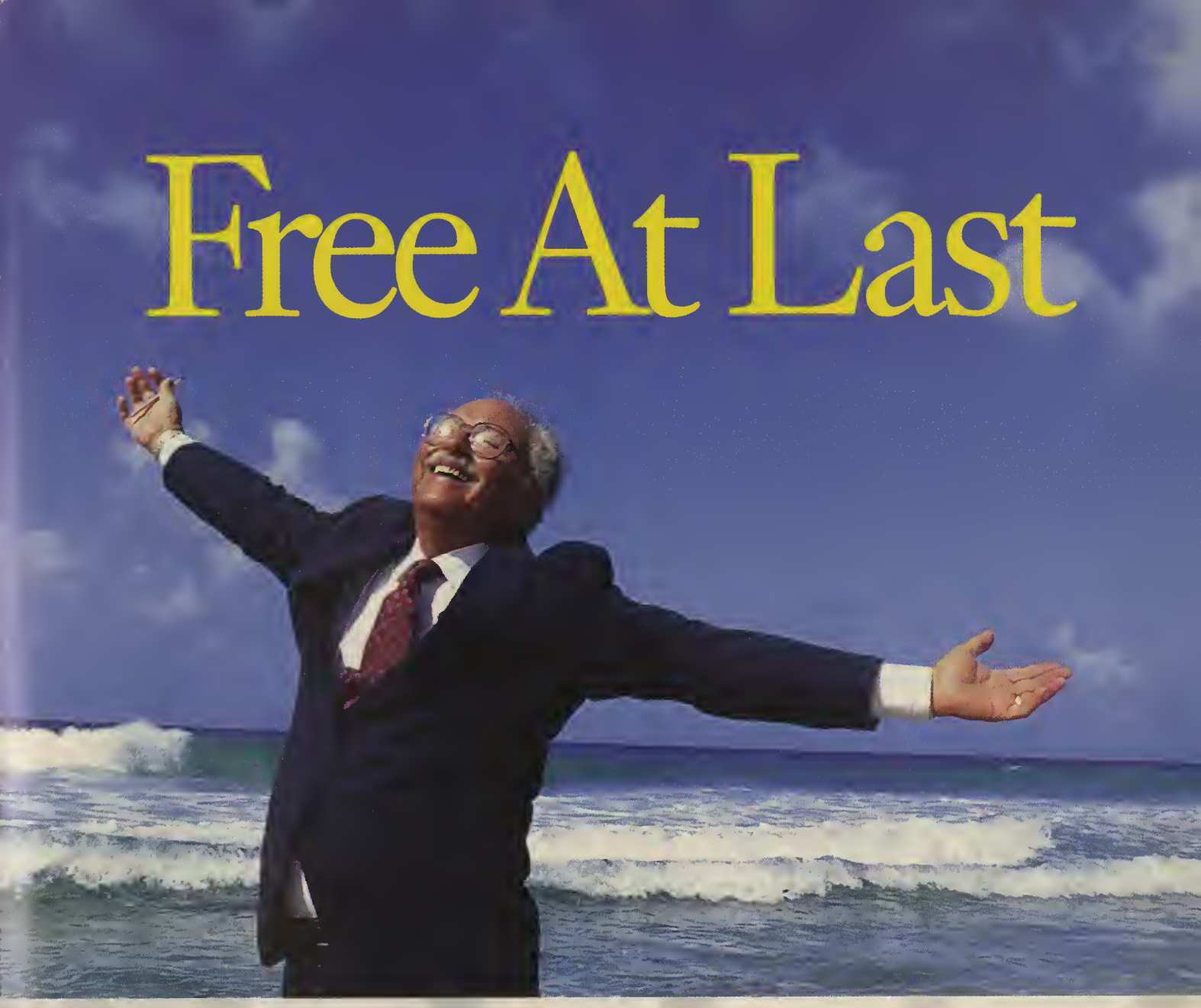

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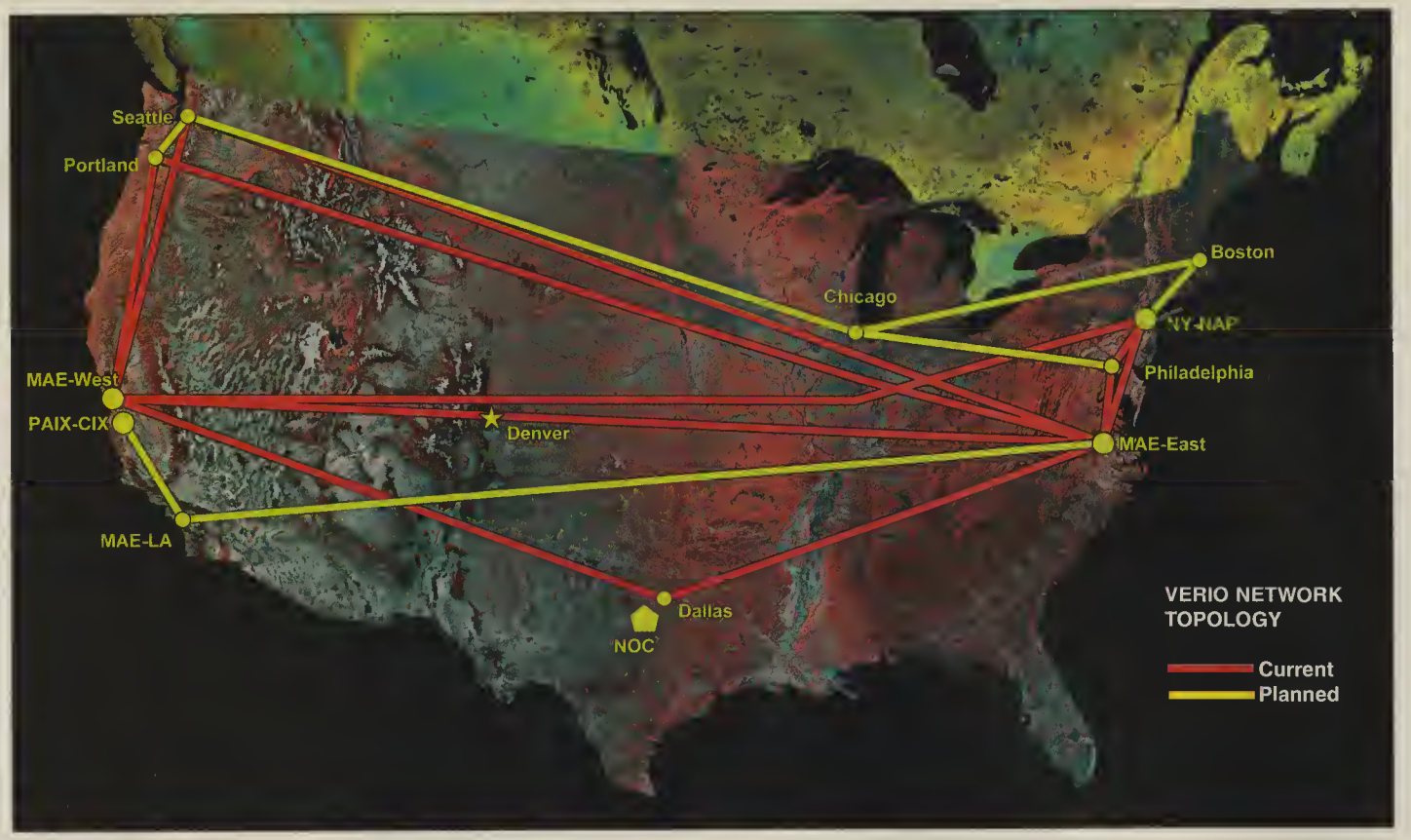

VERIO – A Horse of a Different Backbone Strategy

by Steve Clark

Everybody wants a piece of the pie. At this point, it seems many businesses are getting in on the action. Profits will follow. Such behavior is perfectly normal and legitimate in emerging industries. Market participation comes first. Those who make the cut are rewarded with profits—sometimes large profits.

HISTORY

Verio was formerly World Net Access, an ISP founded in 1996. Early this year, it secured **$80** million in venture capital from several investors to launch a "national brand" of ISP. Some of its backers include Norwest Venture Capital, Centennial Funds, Bessemer Venture Partners, Boston Capital Ventures, Telecom Partners, Providence Equity Partners, Fleet Equity Partners, and Brooks Fiber Properties. Brooks owns a 23 percent stake in Verio. Verio is now among the best funded Internet service providers.

Verio now owns 7 ISPs outright and has a presence in 20 of the top 50 U.S. markets. The company hopes to be in 50 of the top 100 markets within the next two years.

Justin Jaschke, Verio's Chief Executive Officer, was formerly the Chief Operating Officer of Nextel, a wireless communication company. Prior to that, Jaschke was the President of OneComm and CEO of Bay Area Cellular Telephone Company.

Although the company plans to be a dominant national ISP, it hopes that its local affiliates retain their autonomy. Jaschke dubbed Verio as "the first national Internet service provider that is local." The ISPs that Verio has acquired are among the best in their respective regions and the company believes that its strengths are a function of these top-shelf ISPs. By joining the Verio family, these already strong ISPs now have access to greater resources for expansion and marketing. Although the company owns 7 ISPs, it prefers to only have a controlling interest in the local providers. Local affiliates have access to Verio's backbone, network operations center (NOC), and a war chest of funds.

SERVICES

Verio really is two companies serving two different types of customer. Verio, the holding company, serves the Internet providers which it owns. These services include access to Verio's evolving backbone and its network operation center (NOC) services. Verio, the national ISP, is focused on providing high-speed connections to small- and medium-sized businesses. "While others have focused on consumers or the Fortune 1000 companies," Jaschke says, "Verio's target market is the other seven million mid-market businesses in the U.S. that

must participate in Internet communications and commerce if they are to stay competitive." With seven million potential accounts out there, Verio must cover a lot of ground very quickly. The best way to do so is to buy up ISPs in major markets. Intertwined with serving ISPs and the ISP's customers are Verio's other services like its re-seller program, web services, firewall security services, and value-added Internet commerce consulting. Upon acquiring its affiliates, Verio immediately became one of the largest web hosting companies in the industry. The company also has developed many strategic relationships with hardware manufacturers and software developers such as Cisco, CyberCash, Microsoft, Oracle, and Raptor Systems. For example, Verio affiliates will be offering Raptor Systems' firewall security product to their customers. *The Wall* is Raptors' firewall product that sells for less than **$1,000**, and Verio affiliates will be among the first ISPs to sell it.

OPERATIONS

Verio's backbone is still in its infancy. Each new acquisition makes the company's backbone more complex. At this time, Verio is leasing connections through Sprint's backbone and is planning to boost its connectivity to the OC-3 level. The company has also established a presence at MAE East, MAE West, New York NAP, and the Digital Internet Exchange in Palo Alto.

Since Verio's acquisitions have been high-end ISPs, the company can offer all levels of dedicated service from DS-0 through DS-3. As different services become available in each market, Verio affiliates will offer ISDN and newer services like xDSL and even wireless.

Verio refers to its NOC as its *National Customer Care Center*. The center is open 24 hours a day, 7 days a week. Furthermore, Verio affiliates have access to the Care Center's resources, including end-user support. In the big picture, it is far more efficient for the holding company to consolidate its support staff rather than having dozens of support staffs located in dozens of cities nationwide.

But, small local ISPs can benefit most from Verio's access to capital. Large providers may have the money and infrastructure to expand into markets, but the ISPs who are already there have the mobility to move quickly in their own back yards. Instead of building a national backbone from the ground up with dozens of POPs, Verio has chosen to work *with* local ISPs rather than compete against them. This is an efficient, less costly approach in which all parties benefit. Verio establishes its national presence though the customer bases of existing ISPs. The ISPs, as mentioned above, get a national backbone and a 24x7 NOC. Furthermore, the ISPs can also expand quickly through their affiliation with Verio, and can take part in advertising, marketing, and promotions that Verio plans to initiate.

Justin Jaschke, Verio's Chief Executive Officer

Verio is also handling all the billing for its affiliates. It uses the Keenan accounting system, which is the same system that AT&T WorldNet has been using. The system is very powerful, but is also very expensive.

CRITERIA FOR ACQUISITION

Verio prefers to hold minority ownership to preserve the entrepreneurial spirit at the local level. The company is not looking to acquire just any ISP. Candidates for acquisition must have a strong business focus and growth interest. Since Verio's plan is to expand the subscriber base of dedicated Internet connections, it is looking to buy ISPs whose revenue from dedicated connections and web hosting combined is at least 50 percent of total revenue. Internet providers who have mostly dial-up accounts are not good candidates for takeover.

Verio does not wish to micro-manage its affiliate ISPs. Therefore, it is looking for providers who have a good management team already in place. The ISPs that it has already acquired have had a minimum staff size of 15, each with a dedicated sales staff.

The company has no problem with the idea of acquiring multiple ISPs in a single market or region. For example, there are 2 Verio affiliates in Portland, Oregon: Structured Network Systems (`www.structured.net`) and RAINet (`www.rain.net`). For the entire Pacific Northwest region, Verio has 6 affiliates. Since Verio's scope is so wide, it benefits from multiple affiliates in a market *if* each affiliate has a specialty. One affiliate may specialize in dedicated business connections while another may be a web hosting service. A third may not be an ISP at all but a value-added Net commerce consulting firm. Since Verio is actively pursuing all three of those markets, all three independent companies could join the Verio family. Moreover, since each company has a niche, there is no conflict of interest.

VERIO IS NOT JUST FOR INTERNET ROAMING

Although Verio owns access points throughout the United States, the company offers more than roaming services. Roaming is more of a consumer market in which other companies, like iPass, specialize.

Verio is in the business of buying ISPs and consolidating operations, to an extent. The iPass alliance (`www.ipass.com`) is in the business of buying dial-up connections from worldwide ISPs and selling them back to other members of the alliance. The iPass alliance is just that—an alliance. The company does not own any ISPs nor does it plan to. IPass is based on providing roaming services to consumers through dial-up and ISDN connections.

Verio's focus is on dedicated connections for small- and medium-sized businesses. It is in the process of building a national network and is doing some peering with larger providers.

The iPass alliance has a presence in 160 countries. Of the 70 countries that it is

not in, few are developed and have little use for the Internet. Verio, at this point, is focusing on North America.

For the ISP, participation in iPass requires a commitment much different from participation in Verio. For starters, ISPs don't sell a controlling interest to iPass; they simply join an alliance and pay for the services they receive. An ISP with ports in a popular city can actually make money through an alliance with iPass. Example: Your ISP joins iPass and your customers use $500 worth of roaming services in one month. In the same month, you provide connectivity to other ISPs for the sum of $800. In this case, you will get a **$300** check from iPass.

Another roaming service is offered by HomeGate (`www.homegate.net`), which is an iPass alliance member that sells directly to consumers. Homegate's demographic is business travelers who spend more than 30 minutes online while on the road. The company has over 1,000 POPs in 690 cities and 160 countries worldwide—numbers similar to iPass. Unlike iPass, which bills ISPs, HomeGate bills customers directly. Fees are **$15** per month plus10 cents per minute in the U.S. and Canada, and 20 cents per minute in all other countries.

What we're seeing here is a mad rush to the Internet which is backed by venture capital. In this emerging industry, truly profitable companies are the exception. The trend seems to be toward mergers, acquisitions and strategic partnerships in hopes that when this whole thing shakes out, a privileged few will own the rights to the markets, the technology, and the standards. This does not mean that the Internet itself is consolidating into one big company. The RBOCs have yet to take over. Maybe WorldCom has a strong corner on the Net's infrastructure, but nobody is a clear winner yet in the areas of consumer connections, corporate connections, web hosting, or content. There is still a lot of competition in the Internet industry between browsers, plug-ins, protocols, and even debates over what the Internet should *be*. But while the whole thing is still expanding, many companies are finding a good excuse to join.

Verio and iPass are smart because they are not trying to be all things to all people. The emergence of these companies, however, has produced a very desirable end result for Internet users — the freedom to access the Net from almost anywhere. Previously, this was a luxury for AOL and CompuServe users, but now, locally-based small ISPs can offer worldwide connections to their customers.

As the Internet continues to rapidly evolve, a little consistency goes a long way. ◆

VERIO AFFILIATES

AccessOne Internet Services	Kirkland, WA	www.accessone.com
CCNet	Walnut Creek, CA (1993)	www.ccnet.com
Computech	Spokane, WA (1986)	www.iea.com
Frederick Network Technologies	Frederick, MD (1994)	www.fred.net
Global Enterprise Services, Inc	Princeton, NJ	www.ges.com
Internet Interstate	Bethesda, Maryland	www.intr.net
National Knowledge Networks	Dallas,TX	www.nkn.net
Network Intensive	Irvine, CA	www.ni.net
NorthWestNet, Inc.	Bellevue, WA	www.nwnet.net
OnRamp Technologies, Inc.	Dallas, TX	www.onramp.net
Pacific Rim Network	Bellingham, WA	www.pacificrim.net
Pioneer	Global Network, Boston, MA	www.pn.com
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RUSTnet,	Bloomfield, MI	www.rust.net
Signet Partners	Austin, TX	www.sig.net
Structured Network Systems	Portland,OR	www.structured.com
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West Coast Online	San Francisco, CA	www.wco.com

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ISP TECH TALK by Avi Freedman

WHERE WE ARE IN THE "ROUTING COLUMNS" SERIES

This month, we'll talk more about BGP and introduce some concepts and details that you'll need to have before we can move on to showing you how to actually configure a router to speak BGP to your provider(s).

By the end of next month's column you should understand enough about BGP to set it up in a simple and safe configuration if you're single or multi-homed.

In future columns we'll be talking about things like RIP, OSPF, and other internal routing protocols. Also in future months we'll talk about more exotic BGP features, but we're going to keep it pretty simple for now.

BGP is a routing protocol—it's used to tell people *outside* your network (upstream providers or "peers") about the routes (or portions of the IP address space) you know how to get to inside your network. *The primary purpose of BGP4 (as we're studying it here) is to advertise routes to other networks (Autonomous Systems).* The secondary purpose of BGP4 is to get routes from providers and peers so that you can make more intelligent decisions about how to send traffic out of your network. BGP stands for Border Gateway Protocol. The popular BGP protocol that people speak of when they ask, "can a Cisco 2501 speak BGP?" is actually BGP4. BGP as we're studying it here is strictly an EGP, or Exterior Gateway protocol.

BGP TERMINOLOGY PART I

An AS, or Autonomous System, is a way of referring to someone's network. That network could be yours; a friend's; MCI's; Sprintlink's; or anyone's. Normally an AS will have someone or ones responsible for it (a point of contact, typically called a NOC, or Network Operations Center) and one or multiple border routers (where routers in that AS peer and exchange routes with other ASs), as well as a simple or complicated internal routing scheme so that every router in that AS knows how to get to every other router and destination within that AS.

When you "advertise" routes to other entities, one way of thinking of those route advertisements is as promises to carry data to the IP space represented in the route being advertised. For example, if you advertise 192.204.4.0/24 (the Class C starting at 192 .204.4.0 and ending at 192.204.4.255), you promise that you know how to carry that data destined for any address in 192.204.4.0/24 to its ultimate destination. The *cardinal sin* of BGP routing is advertising routes that you don't know how to get to. This is called *black-holing* someone. If you advertise some part of the IP space that is owned by someone else, and that advertisement is *more specific* than the one made by the owner of that IP space, then all of the data on the Internet destined for the black-holed IP space will flow to your border router. Needless to say, this makes that address space disconnected from the Net and makes many people unhappy. The second most heinous sin of BGP routing is not having strict enough filters on the routes you advertise. The bottom line: Test your configs and watch out for typos. Think through everything that you do in terms of how it could screw things up.

Also, one terminology note: Classless routes are sometimes called *prefixes*. When someone talks about a prefix they're talking about a route with a particular starting point and a particular specificity (length)—So 207.8.96.0/24 and 207.8.96.0/20 are *not* the same prefix (route), because they are of a different specificity—a /24 is as big as one Class C and /20 is as big as 16 Class Cs.

BEING "CONNECTED" TO THE INTERNET

Throughout this discussion it's critical to think about what it means to be connected to the Internet. To be connected to the Internet, for each host that is on the Internet, you need to be able to send a packet out a path that will ultimately wind up at that host. Furthermore, that host has to have a path back to you. This means that whoever provides Internet connectivity to that host has to have a path to you. This ultimately means that the provider must hear a route that covers the section of the IP space that you are using, or you will *not* have connectivity to the host in question.

Every IP address that you can get to on the Internet is reachable because someone, somewhere, has advertised a route that "covers" it. Similarly, if there is not a generally-advertised route to cover an IP address, then no one on the Internet will be able to reach it.

Avi Freedman started Net Access, the Philadelphia area's original ISP, in October of 1992. Net Access is currently a regional ISP, with more than 80 downstream Internet providers and dedicated-line customers, and thousands of dial-up and web-hosting customers.

Avi also is Cofounder of a new national ISP, Net Access USA, which focuses on dedicated connectivity for ISPs. For information, see `www.netaccess.net`.

Avi has been very active on the inet-access mailing list and is a vocal proponent of the continued viability of startup and existing ISPs. He is also on the ISP/C Board as Director at Large. ISPs can join inet-access by sending e-mail to `inet-access request@earth.com` with SUBSCRIBE in the subject. Avi can also be reached at `freedman@netaxs.com` or `http://www.netaxs.com`

HARDWARE AND SOFTWARE FOR SPEAKING BGP

The most commonly used implementations of BGP are Cisco routers; Bay routers; and PC clones running Linux, BSD, or some other UNIX variant and a program called *gated* to manage BGP. We're going to talk about configuring Ciscos for BGP now, but you *can* use Bays or Gated boxes. For now, I'd advise using Ciscos over Bays for BGP since there are many more Cisco-literate people, and since the Bay command-line interface (BCC, or Blatant Cisco Clone) isn't out yet. Gated is sort of a "BGP assembly language," and I'd advise against using it unless you have a very good low-level understanding of routing and of BGP.

A full view of the Internet is basically all the BGP routes that your upstream providers hear. You'll need a Cisco 4500 or 4700 with 32 MB; or 36xx, 720x, 70x0, or 75xx with 64 MB to do this. Currently, you can take at least one or two views of the 45,000 routes or so that are the Global Internet Routing Table. A view is another way to get to a certain prefix. So both routes, or views have the same starting IP and prefix length, but each route comes from a different source.

But a Cisco 2501 will do fine to announce your routes to the world. It should be able to handle 1.5 loaded T1s worth of traffic as well, and take 5,000 to 15,000 BGP routes from your providers. This allows you to do some tuning of your outbound traffic flow.

TERMINOLOGY PART II: PEERING SESSIONS AND ASNs

There's a bunch of terminology associated with BGP. We already talked about Autonomous Systems. An *ASN* is an Autonomous System Number used to represent an Autonomous System to the world. That number "identifies" your network to the world. Except for Sprintlink, most networks use (or at least show to the world) only one ASN.

BGP-speaking routers exchange routes with other BGP-speaking routers via peering sessions. At a technical level, this is what it means for one network or organization to peer with another. Here's a simplified Cisco code snippet of a router bgp clause:

```
router bgp 64512
 <omitted lines>
 neighbor 207.106.127.122 remote-as 701
 <omitted lines>
 neighbor 137.39.10.46 remote-as 4969
 <omitted lines>
```

The clause starts out by saying router bgp 64512. This means "What follows is a list of commands that describe how to speak BGP on behalf of ASN 64512." (We're using 64512 in our examples because it's not a live ASN, so if anyone uses a configuration straight from this column and leave the fake ASN, automated route-examination programs will detect it). ASNs go from 1-65535, and 64512 is in the reserved range.

To bring up a peering session, all you need to do is have that one neighbor line under the router bgp clause. In this example, 137.39.10.46 is the *remote* IP address of a UUNET router (UUNET is ASN 701). Remote, that is, with respect to the customer's router. 207.106.127.122 is the remote IP address of a Net Access router (Net Access is ASN 4969).

In practice, however, you almost always use more than that one line to tell BGP how to exchange routes with that neighbor via that peering session. A typical neighbor clause is:

```
router bgp 64512
 <omitted lines>
 neighbor 207.106.127.122 remote-as 4969
 neighbor 207.106.127.122 next-hop-self
 neighbor 207.106.127.122 send-communities
neighbor 207.106.127.122 route-map prepend-once out
 neighbor 207.106.127.122 filter-list 2 in
 <omitted lines>
```

WHAT DO YOU DO WITH BGP?

Speaking BGP to your providers and/or peers lets you do two things. The first is to make semi-intelligent routing decisions concerning the best path for a particular route to take outbound from your network. Otherwise you would simply set a default route from your border routers into your providers. Second, and more importantly, you can announce your routes to those providers, for them to in turn to announce to others (transit) or just use internally (in the case of peers).

PEERING SESSIONS

The purpose of the neighbor clauses is to bring up peering sessions with neighbors. For now, assume that all neighbors must be either on the other end of a leased-line from you, or on a LAN interface (Ethernet, Fast Ethernet, FDDI). It is possible to have BGP peering sessions that go over multiple hops—but eBGP multihop is a more advanced topic and has many potential pitfalls.

Every time a neighbor session comes up, each router will evaluate every BGP route it has by running it through any filters you specificity in the neighbor clause. Any routes that pass the filter are sent to the remote end. This filtering is a *critical* process—the most dangerous element of BGP is the risk that your filtering will go awry and you'll announce routes that you shouldn't to your upstream providers.

While the session is up, BGP updates will be sent from one router to the other each time one of the routers knows about a new BGP route or needs to withdraw a previous announcement.

The `sho ip bgp summ` Cisco command will show you a list of all peering sessions:

```
brain.netaxs.com#sho ip bgp summ
BGP table version is 1159873, main routing table version 1159873
44796 network entries (98292/144814 paths) using 9596344 bytes of memory
16308 BGP path attribute entries using 2075736 bytes of memory
12967 BGP route-map cache entries using 207472 bytes of memory
16200 BGP filter-list cache entries using 259200 bytes of memory

Neighbor        V    AS      MsgRcvd   MsgSent   TblVer     InQ   OutQ   Up/Down    State
205.160.5.1     4    6313    0         0         0          0     0      never      Active
207.106.90.1    4    64514   1145670   237369    1159873    0     0      4d03h
207.106.91.5    4    64515   6078      5960      1159869    0     0      4d03h
207.106.92.16   4    64512   6128      6782      1159870    0     0      4d03h
207.106.92.17   4    64512   5962      6894      1159870    0     0      10:08:46
206.245.159.17  4    4231    161072    276660    1159870    0     0      2d05h
207.44.7.25     4    3564    6109      310292    1159867    0     0      22:40:50
207.106.33.3    4    64513   164708    724571    1159866    0     0      3d23h
207.106.33.4    4    3564    6086      274182    1159853    0     0      4d03h
207.106.127.6   4    6078    5793      310011    1159869    0     0      2d03h
```

Most of it is pretty self-explanatory; briefly:

- The `V` column is the BGP version number. If it is not 4, something is very wrong! BGP version 3 doesn't understand about Classless (CIDR) routing and is thus dangerous.
- The `AS` column is the remote ASN.
- `InQ` is the number of routes left to be sent to us.
- `OutQ` is the number of routes left to be sent to the other side.
- The `Up/Down` column is the time that the session has been up (if nothing is in the State column) or down (if something is).
- Anything in the `State` column indicates that the session is *not* up. A State of `Active` means that the session is inactive. Just one of the nomenclature flaws of BGP.

This is a session summary from one of Net Access's core routers. The 6451X Autonomous Systems are BGP sessions to other Net Access routers—those ASNs are not shown to the world. The 205.160.5.1 session is a session that is down, and the sessions where the remote Autonomous Systems are 4231, 3564, and 6078 are external peering sessions. (This router peers with our Pennsauken, MAE East, and MAE West routers via the 645xx sessions.)

eBGP vs. iBGP: A NOTE

We're talking about *eBGP* in this document. eBGP and iBGP share the same low-level protocol for exchanging routes, and also share some of the algorithms, but eBGP is used to exchange routes between *different* Autonomous Systems, while iBGP is used to exchange routes between *the same* Autonomous System. In fact, iBGP is one of the interior routing protocols that you can use to do active routing inside your network. We'll talk more about iBGP in future columns when we cover all of the major interior routing protocols: OSPF, iBGP, IS-IS, RIP, and RIPv2.

The major difference between eBGP and iBGP is that eBGP tries like crazy to advertise all known BGP routes to everyone—you have to put filters in place to stop it from doing so. iBGP is actually pretty difficult to get working because it tries like crazy not to redistribute routes. In fact, all iBGP-speakers inside your network have to peer with all other *iBGP* speakers to make it work. This is called a *routing mesh* and, as you can imagine, is quite a mess. If you have 20 routers, each router has to peer with every other router. The solution to this is BGP confederations—a topic for a future column.

BGP AND THE SINGLE-HOMED

When you have one upstream provider, it is rarely desirable to speak BGP to them. Why? Well, you only have one path out of your network. So filling your router with 45,000 BGP routes isn't going to do you any good, since all of those routes point to the same place (your one upstream provider).

And if you have one upstream provider, it's almost guaranteed that you are using sub-allocations (CIDR delegations, to be precise) of their larger IP blocks (aggregates). In this case your provider is *not* going to advertise your more specific routes—see May 1997's column for an explanation.

ROUTE WITHDRAWLS

If you're single-homed, the whole Internet doesn't need to know if you lost connectivity to your provider, since there's no other path to get to you.

Similarly, in case it's not obvious, if you *are* multi-homed and your providers are announcing more specific prefixes for you, then they should *stop* announcing you when they don't know how to get to you any more.

The beauty of speaking BGP to your providers is that when you lose connectivity to them (a T-1 or 56k or what you have goes down), the BGP session will go down as well and all of those route advertisements will be automatically withdrawn.

AS-PATHS

Every time a route is advertised via BGP, it is stamped with the ASN of the router doing the advertising. As a route moves from Autonomous System to Autonomous System (network to network), it builds up an AS-PATH. Each route starts out with a `null AS-PATH`, represented by the *regular expression* ^$.

The AS-PATH is useful for the following reasons:

- It provides a diagnostic trace of routing on the Net. If you have full routes in one of your routers, or have query access to a router that does (such as telnet://route-server.cerf.net), you can find the route that encompasses a particular IP address and see which ASNs have advertised it. If you do some poking around, you can even see how a provider is actually connected (as opposed to what they might claim...)

- It is one of a number of metrics that determine how routes heard via BGP are inserted into the actual IP routing table. We'll be talking more about metrics in the future.

- It is something that allows you to do policy routing of sorts, although policy routing has many different definitions, so watch out. You use the AS-PATH to filter routes. Why would you want to do this? Perhaps you only want to take UUNET, MCI, and ANS route from one provider (because of limited memory in your router). Or perhaps you want to make sure you only send routes originating in your network. There are many reasons why you'd want to filter based on the AS-PATH. These reasons will become clear as you read on. While it's true that most filtering is now done with communities (a community is another number that you can stamp on a route heard or to be announced via), AS-PATH filtering is the best first step that you can work with to get comfortable with filtering routes. And if your network is fairly simple (as 90 percent of the networks are), then you won't need anything fancier for quite some time. We'll talk about doing this in a few months, when we focus on tuning outbound traffic flow.

For routes of the same specificity, AS-PATH length is going to be the deciding factor for choosing which of multiple routes gets used by the router (i.e. put into the IP routing table) when you're just starting out.

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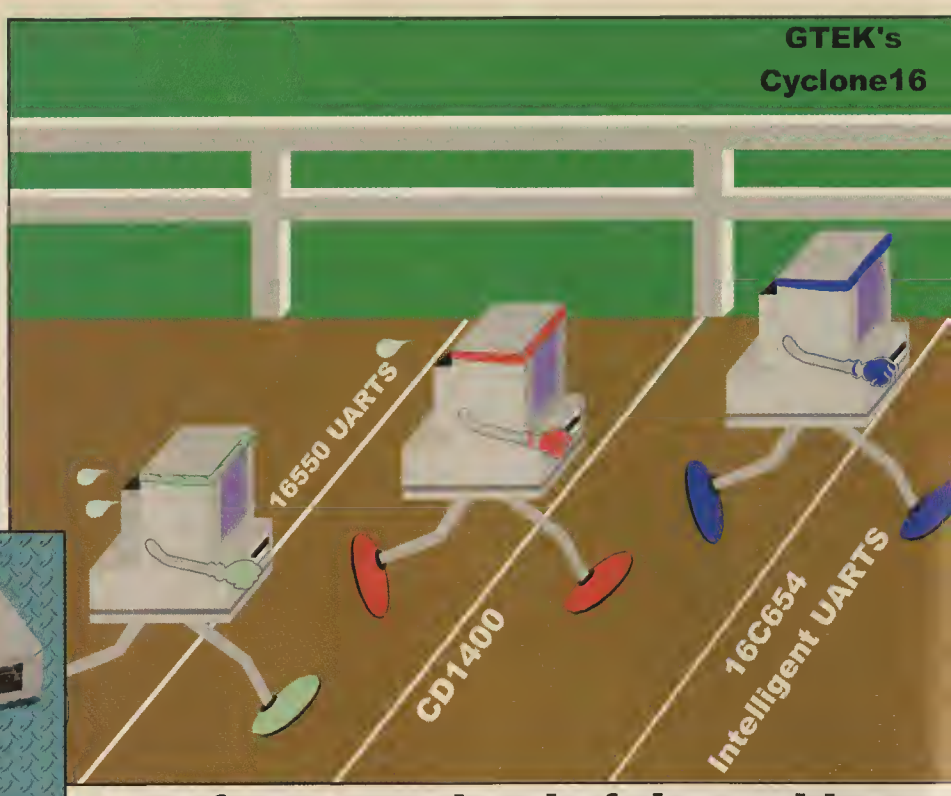

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BGP METRICS (ATTRIBUTES) AND ROUTE SELECTION: INTRODUCTION

We'll shortly go into BGP metrics and attributes—parameters associated with BGP routes that allow you to select and change the selection of the best BGP route for a certain destination.

For now, keep in mind that unless you do any tuning on your own:

- The most specific route always wins. Whether it's a BGP route or a static internal route, the most specific route always wins.
- If there is a choice between multiple BGP routes, then the one with the shortest AS_PATH wins.

WHAT IS ROUTE FLAP AND WHY IS IT BAD?

When you assert a route—saying "I know how to get to 192.204.4.0/24" based on some internal knowledge that you actually do know how to get to 192.204.4/0—the natural (and previously-thought-to-be-correct-thing-to-do) is to withdraw that assertion if you in fact no longer know how to get to that route.

But look at what happens when you withdraw that assertion. Your providers must then also withdraw that assertion. And then their providers and peers must do the same. All in all, thousands of routers around the world now have to look at that route and decide if they have a next-best path in their BGP table, and insert it as the current best path in their IP routing table. This consumes many CPU-seconds on routers that are sometimes very busy.

In fact, it was consuming *so much* CPU time a few years ago that Sean Doran of Sprintlink said, "this must stop." Several people came up with an idea, which Cisco implemented in record time, to dampen the route flaps. You'll hear people say "damp" and "dampen." There's no real consensus about which is the correct term.

What this means in practice today is that if your routes flap more than one or two complete up-down-up cycles, then

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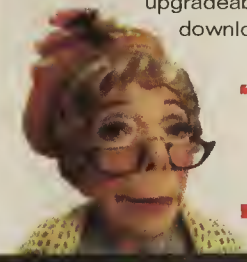

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you will be dampened by many providers for at least an hour or so. So even if you're only single-homed, you will be dampened if your provider withdraws your routes every time your T-1 flips up and down a few times because some Bell guy tripped over a wire.

So do not ask your upstream provider to announce you unless it makes a difference. The benefit of being multiply-announced outweighs the possible negative effects of being dampened due to instability in either your or your provider's network.

WHAT TO KEEP IN MIND WHEN CONFIGURING BGP

When you're bringing up a new BGP session, or considering how to do BGP in general, the things to keep in mind for each peer are:

- What routes do you want them to hear? The most important thing is to ensure that you do not redistribute routes to which you are not providing Internet connectivity.
- What do you want to do with the routes that you hear via the session? Do you want to tune them? Only take some? Take them all?
- Do you have the memory and CPU in your router to really do what you want?

INTERNET CONNECTIVITY WITHOUT BGP

Let's review what happens when you are connected to the Internet without speaking BGP to your provider. Last month's column explained this in more detail.

- You create a default route toward your upstream provider, and all non-local packets go out the interface specified by the route
- Your provider probably put static routes toward you on their side, and redistributes those static routes into their IGP. Then they probably redistribute their IGP into BGP —unless all of its BGP is done statically.

If you have any address space inside of your provider's larger netblock or aggregate, then you won't be advertised to the outside world specifically—your provider will just advertise their larger block. If you have any other networks (an old Class C; customers with address space; etc.), then your provider will just statically announce those routes to the world and statically route them inside their network to your leased-line/ router interface(s).

With BGP, your provider gives you all of the routes they have (the easy part), and listens to your route announcements and then redistributes some or all of those to their peers and customers. This is the hard part for them. The net difference is just that they may start advertising a more specific route (no mean task in a complicated network designed, as most networks are, to prevent the accidental leaking of more specific routes) or that the routes that they normally advertise for you under just their ASN will now have your ASN attached as well.

BGP AND THE MULTI-HOMED

OK, so you're multi-homed. What is the most important thing about BGP to you? The ability to have it announce routes. Getting full or partial routes from your providers is cool—and may even be useful—but you can do almost as well by just load-balancing all outgoing traffic in either a round-robin or route-caching manner.

So, the most important thing about being multi-homed is the ability to have your routes advertised to your providers —and by them to their providers and peers (i.e. to the rest of the Internet). Doing this basic level of route advertisement is not hard. You just have to do it in a paranoid way.

If you screw up BGP routing, then you may get slapped down pretty hard. Screw ups with BGP route advertisements can be felt all over the Internet. To repeat: *Screw ups with BGP route advertisements can be felt all over the Internet.* If your provider is smart, then they will also implement filters to prevent you from screwing them and the Internet up. But don't count on it.

If you were to announce a route that was more specific than, for example, the otherwise-best route for Yahoo's web servers, you would black-hole Yahoo for a period of time. Needless to say, they would not be very happy with you. The solution is to do good filtering on your end—and for your provider to also do excellent filtering wherever possible.

Before you start playing with BGP, you might really want to wait and read the "Configuring a Cisco Router" column (coming out in the next few months). If you do go ahead and are implementing BGP for the first time, then get a friend or another provider to review your proposed configs for you before implementing them.

MULTI-HOMING AND LOAD-BALANCING

Generally, the goal of multi-homing is to use both connections in a sane manner and load-balance them somehow. Ideally, you'd like roughly half the traffic to go in and out of each connection. You'd also like fail-over routing, where if one connection goes down, then the other one keeps you connected to the Internet. In an ideal network, you'd be able to have any one of your connections to the Net go down and still maintain connectivity and speed.

Incoming traffic is controlled by how you announce your routes to the world. Packets will flow into your network because someone heard and is using a route announcement. Outgoing traffic is controlled by the routes that you allow to flow into your border router(s)—and is thus much easier to control and tune.

APOLOGIES

Sorry if this seems like a teaser—we'll get to the actual BGP configuration process and examples next month. If you're impatient, a somewhat long document is available at `www.netaxs.com/~freedman/bgp/bgp.html`. ◆

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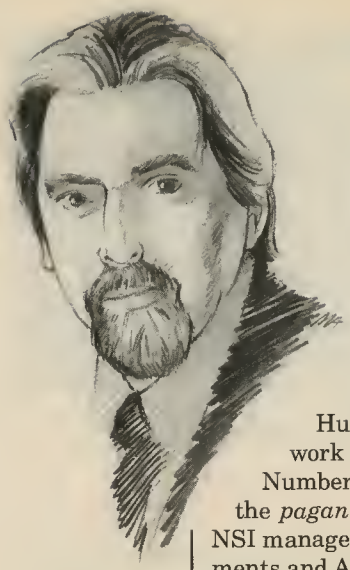


@INTERNET by Thom Stark

HOW HARD IS CIDR?

Thom Stark is President of STARK REALITIES, an Internet business consulting firm based in the San Francisco Bay area. He also conducts seminars and tutorials about the Internet at trade shows and for business and user groups. Reach him via e-mail at thom@starkrealities.com or visit his web site at www.starkrealities.com.

I was researching the IAHC new domain names proposal when Kim Hubbard's January 2 announcement of Network Solutions' American Registry for Internet Numbers (ARIN) proposal was cross-posted from the *pagan* mailing list to the *iahc* list. Kim is the NSI manager in charge of IP network number assignments and ARIN is a proposal to create a not-for-profit entity to take charge of assigning large CIDR blocks to entities in the Americas.

ARIN, basically, is a mechanism designed to permit NSI to jettison its responsibility for assigning IP network numbers, (an activity which makes no money for its owner, Science Applications International Corporation, and which requires a highly-skilled staff) allowing it to concentrate, on registering domain names (an activity which is largely automated and which makes SAIC lots and lots of money). It is also a harbinger of a sweeping change in how Internet administration and governance are financed and from whence they draw their legitimacy.

Before NSI began charging for domain name registrations in 1995, the costs for most Internet administrative and governance activities were underwritten by the U.S. government. They were "free" in the sense that their costs were hidden. U.S. taxpayers picked up the bills, so the direct beneficiaries of these services received them without being forced to confront the unpleasant truth that there really ain't no such thing as a free lunch.

The domain name registry was easy to make self-financing. The concept of a domain name as a valuable property is something even relatively unsophisticated Internet users can grasp. It's a lot harder to explain to a corporate executive that a block of IP addresses also has value, especially when the Internet Assigned Numbers Authority (IANA—from whom all IP blocks are ultimately delegated) encourages the IP community to think of them as "leased" rather than as "owned."

ARIN proposes to charge large ISPs and Autonomous Systems in the Americas enough for new IP block assignments to recover the costs of providing and administering them.

Following the ARIN list made it clear to me that an awful lot of smaller ISPs misunderstood who was going to be expected to pay, how much they were going to pay and what they were going to be paying for. It was also clear that a lot of ISPs who posted to the ARIN list don't understand the Classless Inter-Domain Routing (CIDR) protocol upon which the Internet's routers so desperately depend. They don't "get" route aggregation and they don't understand the concept of block suballocation by which most of them obtain their own IP assignments.

I get the feeling that most of these folks are afraid to admit that they don't know this stuff. It can be confusing, but it's important to soldier on until you understand how it works. Then, and only then, can you intelligently discuss whether the ARIN proposal is "fair"—and whether it even applies to you.

SET THE WAYBACK MACHINE FOR 1992

In many ways, 1992 was a watershed for the Internet. The Honorable Albert Gore, Jr.'s Presidential campaign brought the buzz term "information superhighway" into everyman's vocabulary. The notoriously optimistic Internet Society (ISOC) estimated that the number of Netizens was growing by 15 percent per month and the equally unrealistic folks at CommerceNet agreed with them. Some of the brighter lamps of the Internet Engineering Task Force (IETF) took a look at this ferment of growth and performed a few basic arithmetical calculations on what it might mean for the anticipated demand for new IP network assignments and the routing tables to support them.

What they found was a little scary. The way things were going, the entire IP address space was liable to be gone by 1996, which wasn't going to matter, since the routing tables were due to melt down sometime in 1995.

Both of these dire consequences were artifacts of the original, "classful" IP network allocation scheme. There are, for instance, only 126 Class A networks. Each one consists of about 16 million IP addresses. In the early days of the Net, when nobody could envision a time when there would be more than 10,000-15,000 hosts on a single network, Class As were handed out to practically anyone who asked for one. Almost none of the organizations which got Class As needed them. In many cases, they didn't even need a Class B (about 64,000 hosts). And the folks who got Class Bs didn't need them either.

So, there was an awful lot of wasted address space in the original allocation design. Most of the Class Bs and a lot of the Class As had already been spoken for, which essentially left the 16 million or so Class Cs into which the rest of the world would have to fit.

Except that the existing routers simply couldn't handle 16 million separate, new entries. Terabytes of RAM would be needed to hold the routing table and even the fastest available processors would need hours to do lookups. Clearly, some other way had to be found.

These problems were attacked on two fronts. The first approach was to design a follow-on protocol to take the place of the venerable (and increasingly creaky) IP version 4. This effort, dubbed *IPng* (Internet Protocol the Next Generation) and more formally known as *IPv6*, would eventually result in a protocol with nearly unlimited address space that was designed so that new functionality could be easily added to it and that has an amazing variety of native capabilities. Unfortunately, IPv6 is not yet supported by the major router manufacturers and, until it is, it will remain a solution in search of a market.

The second avenue of attack was the one which crafted an interim solution to both the routing table growth and address depletion problems. That solution, known as *Classless InterDomain Routing* (CIDR, defined in *RFCs 1517, 1518, 1519* and *1520*), worked so well that the IPv4 address space is probably now sufficient to meet anticipated demand through the end of the century. It also permits a technique called *route aggregation* which, so far, has kept the growth of the Internet core routing table down to a linear, rather than an exponential rate.

CLASSFUL ADDRESSES—THREE SIZES FIT ALMOST NO ONE

Until the advent of CIDR, all IP routers examined the first three bits of an IPv4 address to determine its class. If bit 1 was a zero, it was a Class A address. If bit 1 was a 1 and bit 2 was a zero, it was a Class B. And, if bit 1 was a 1 and bit 2 was also a 1, it was a Class C. (We'll ignore Classes D and E for purposes of this discussion.) Each IP address was composed of two parts expressed as a single, 32-bit number in dotted-decimal notation.

In Class A addresses, the first 8 bits made up the network address, leaving 24 bits for individual host addresses. Class Bs used 16 bits for the network and 16 for the host components of the address. Class C addresses require 24 bits for the network segment and use the remaining 8 bits for the host identifier.

Simple, straightforward and totally inflexible, the limits of this approach became apparent in the mid-eighties. Organizations were forced to request multiple Class B or Class C assignments to set up administratively-separate LANs, even if relatively small numbers of hosts were attached. And, if there were more than 254 hosts on a single Class C LAN, a Class B assignment was required, despite the enormous waste of address space that a 255-host LAN entailed. (Both the network itself— the all-zeroes address—and the broadcast address—the all-ones address—were reserved for those purposes and couldn't be assigned to host machines.)

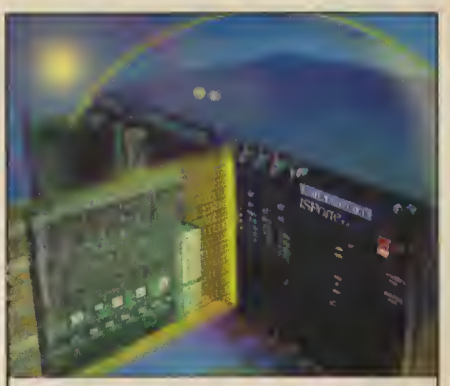
In 1985, in recognition of the need to provide some standard method for breaking classful IP network assignments into smaller, more useful chunks, Mogul and Postel published *RFC 950*. This RFC described a procedure for subnetting—making a lot of little subnetworks out of a big Class A or B net. Subnetting introduced a fundamental new component to IP addressing: the subnet mask. In essence, it extended the network portion of an IP address into the host ID portion, with the extension used to identify the subnet to which the host belonged. It also required that a fully-qualified IP address include both a 32-bit network/host address and a 32-bit submask.

That, in turn, required new routing software be developed that could understand this new address component. Routing Information Protocol version 1 (RIP-1), which is fundamentally classful, but understands basic subnetting, was the first solution. (Unfortunately, RIP-1 only understands symmetric subnets. Thus, all subnets served by a router capable only of RIP-1 must each be the same size.)

1987's *RFC 1009* specified requirements for Internet gateways (i.e.—routers interfacing between two distinct IP networks). Among them was the requirement that gateway routers understand variable-length subnet masks. (Variable-length masks permit subnets of different sizes to be constructed out of a given classful network, giving the network architect much greater leeway in designating subnets of sizes appropriate to their specific applications.)

That specification worked pretty well for almost 15 years.

Then came the twin bugaboos of IP address space depletion and exponential routing table growth and something had to give.



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CIDR—A CLASSLESS ACT

What the CIDR solution did was to discard classful IP addressing altogether. Instead, it extended the IP network submask concept to the definition of IP networks in general. Where earlier, classful routers look at the first three bits of the address to determine the network class, CIDR-capable routers look at the combination of the 32-bit IP number and the 32-bit submask. The Border Gateway Protocol (which core routers use to route IP packets between the Internet's Autonomous Systems) was revved to support CIDR in BGP-4. That then permitted NSI's InterNIC to assign large blocks of contiguous IP numbers to ISPs. They, in turn were then free to further sub-allocate appropriately-sized chunks of that address space to their customers. This had the welcome effect of offloading much of the increasing burden of IP number assignment from NSI's InterNIC to the individual ISPs who, at least theoretically, know their customers well enough to be able to make appropriately-sized IP assignments to them.

That's important because one of the primary values of CIDR is that a network of any size desired can be defined to the nearest power of two, using CIDR masking. In fact, a useful general rule of thumb in sizing CIDR block suballocations is:

1. Take the maximum desired number of nodes on a single subnet, double it and raise it to the nearest power of two (to allow for future growth). Translate it to binary. The number of digits in the binary expression of the result gives you the minimum desirable size of the host portion of the allocation. As an example, let's take 25 hosts per network. (Doubling gives us 50. The nearest power of two is 64. It takes 7 binary digits to express 64 in base 2, so the host portion of our solution is 7.)

2. Then take the maximum desired number of subnetworks in the total allocation, double it and raise it to the nearest power of two. Translate it to binary. The number of digits in the binary expression of the result gives you the minimum desirable size of the network portion of the allocation. (Continuing our example, let's take 5 subnetworks. Doubling gives us 10. The nearest power of two is 16. It takes 5 binary digits to express 16 in base 2, so the network portion of our solution is 5.)

3. Add together the number of binary digits in the two numbers you obtained in the previous steps. Subtract that sum from 32 (the number of binary digits in an IP number or network mask). The result gives you the "slash number" needed to provide an allocation that will provide sufficient room for future growth pending the widespread adoption of IPv6. In our example, we'd add 7 (the number of binary digits in 64 host nodes per network) to 5 (the number of binary digits in 16 networks), giving us 12. Subtracting that number from 32 gives us 20, meaning that a /20 CIDR block allocation should handily meet the needs of our fictional customer network both now and for the next few years.

You'll notice that CIDR uses "slash notation" to indicate the length of the network mask in bits. Thus, a traditional Class A network would be the equivalent of a /8 (i.e.—the network portion of a Class A IP address is 8 bits long), a Class B would be a /16 and a Class C a /24. Note that smaller "slash numbers" define larger networks (i.e.—networks with more host addresses) and larger "slash numbers" define smaller networks.

CIDR-based networks have another advantage. A gateway router can advertise all the contiguous addresses in a CIDR block range as a single routing table entry. This aggregation of routes keeps the size of the core routing tables down to something that current-day router technology can handle—although it still requires a significant amount of both RAM and CPU horsepower. It is route aggregation that lies behind IANA's advocacy of a "leased" model for IP assignments, rather than an "owned" model.

If a customer changes ISPs and insists on taking "his" IP assignment with him, that range of addresses can no longer be aggregated with the old ISP's CIDR blocks. Instead, it must be advertised as a separate route in the new ISP's router table, since it also won't aggregate with the new ISP's CIDR blocks, either. That adds another static route to the core routing tables. Too many such routes, and the smaller ones will start getting dropped on the floor, breaking the system.

That's a bad thing.

ISPs depend on the Internet's constituent parts to be reachable. If parts of the system become impossible to reach, the value of the whole is diminished relative to that of traditional online services with their proprietary content offerings. It's critical that ISPs understand that the value of route aggregation is maximized only if the address space remains relatively unfragmented. One way in which ISPs can contribute to the routability goals of CIDR is to make certain that their customers understand that any CIDR block allocations they receive from their ISP are leased, not owned. If a customer switches to another ISP, that customer should obtain a new CIDR block from his/her new ISP and renumber his/her network. It's inconvenient, but necessary to minimize route "flapping," which happens when a block switches from one route advertisement to another.

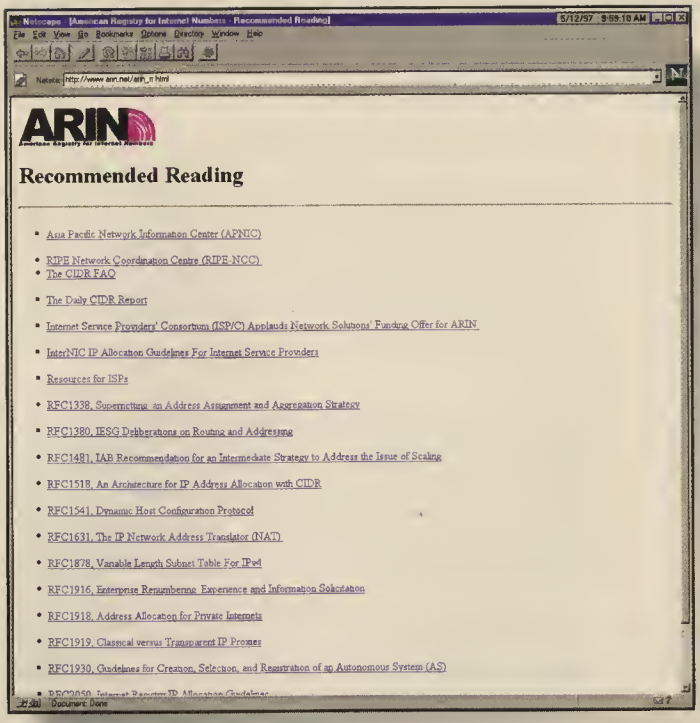
Many smaller ISPs get their own CIDR block allocations from an upstream provider. The route advertisements of those smaller ISPs, in turn, are aggregated with those of their upstream providers.

IANA delegated to NSI the responsibility to allocate IP address assignments for all of North America. Although NSI's policies strongly encourage end users to obtain their CIDR assignments from an upstream provider, if the end user was really, REALLY adamant, NSI has little other choice than to directly grant the applicant a "portable" CIDR block, even though that block is really too small to meet the criteria for advertisement as an exception in the core routers.

ARIN could change that.

NO FALSE IDOLS IN ARIN

ARIN is proposed to be a not-for-profit corporation, established to replace NSI as the body responsible for IP number registration and administration in the Americas. It won't sell IP numbers, but it will charge to recover its costs to allocate CIDR blocks and to determine that any requested allocation is justified.



Membership in ARIN will be **$1,000** per year. Membership currently includes the privilege of attending semi-annual meetings. It may eventually also include the right to vote for members of ARIN's Advisory Board and/or its Board of Trustees. You won't have to be an ARIN member to request an IP block "subscription" from ARIN.

Charges for CIDR blocks will be in the form of an annual "subscription" fee, based on how much space was allocated to the applicant in the previous calendar year. Charges will be weighted so that per-address charges are low for large allocations and high for small ones, thus encouraging large upstream providers to "subscribe" for large annual blocks and resell them at discount rates to the smaller ISPs downstream. Although smaller ISPs will be able to purchase small blocks directly from ARIN, the prices they'll pay are liable to be higher than what their upstream providers will charge them for the same address space. Sample "subscriptions" proposed are:

Allocation	Annual "Subscription Fee"	CIDR Block Size
Small	$2,500	/24 - /19
Medium	$5,000	>/19 - /16
Large	$10,000	>/16 - /14
X-Large	$20,000	>/14

It's important to understand that European and Asian-Pacific Internet users have been directly paying for the costs of IP allocation and top-level administration for some years now. Uncle Sam, in the person of the National Science Foundation, has determined to stop footing the bill in the U.S., so, like it or not, some kind of fee-based mechanism is going to replace the free ride sometime in the immediate future.

Is ARIN the right mechanism? Perhaps so, perhaps not. As of now, it is the *only* proposed alternative to taxpayer funding—and taxpayer funding is definitely the wave of the past.

If you're curious about the proposal, ARIN's home page is `www.ARIN.net`. It includes a terrific reading list at `www.ARIN.net/arin_rr.html`, too. The reading list features links to relevant RFCs, Hank Nussbacher's CIDR FAQ, 3Com's excellent *IP Addressing: Everything You Ever Wanted To Know* and other tools, research materials and addressing/routing-related resources. It also links to RIPE-NCC (Réseaux IP Européens-Network Coordination Center) and APNIC (Asia Pacific Network Information Center), ARIN's European and Pacific Rim counterparts. ◆

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Peering/Interconnection on the Internet as a Telecommunications Carrier

By David S. Holub

For the last year I have been actively working to forge a future as a utility/telecommunications carrier for the ISP business that I started nearly four years ago. Throughout this process I have had the privilege of working with Mr. David Simpson of Young, Vogl, Harlick, Wilson and Simpson LLP of San Francisco. Much of what I will discuss about peering has been shaped by what I've learned from Mr. Simpson. Unlike Mr. Simpson, I have no license to practice law and thus legal questions that arise from this discussion are best forwarded to him. (das@yvhws.com). Beyond my work with Mr. Simpson in this area, as a daily matter I have been directly involved in all aspects related to the engineering, maintenance, operations, purchasing and contract negotiations necessary to produce Internet connectivity over multiple Internet Exchange Points (often called NAPs or MAEs but hereafter referred to as IXPs) for the last two years.

Universal reachability is a fundamental tenet in public networks. It is assumed that if you, the customer, pay for a connection to a public network, then all points within that public network are reachable by you, the customer. This is true of both the Internet and the more traditional public switched telephone network (PSTN). As most of us know, these networks are not single entities but are comprised of many networks that connect together and cooperate to produce universal reachability. To do this they must interconnect and exchange their respective traffic. The notion of "free peering" is directly analogous to a "bill & keep" interconnection relationship between traditional telephone companies, pursuant to which Carrier A agrees to accept and terminate — at no charge — all of the traffic originating on Carrier B's network which is destined to Carrier A's customers in return for Carrier B accepting and terminating — at no charge — all of the traffic originating on Carrier A's network which is destined for customers of Carrier B. The other method of interconnection between common carriers is called *reciprocal billing*. It works the same as the relationship above except replace the phrase "for a negotiated sum" for the phrase "at no charge." In the Internet reciprocal billing would be called *settlements*.

In this age of telecommunications deregulation, significant differences in the size of networks during the phase when one carrier is the incumbent and other carriers are entering the market are very common. It has been argued for years (often by these new networks) that the public is better served by a competitive marketplace and that given the impact of the incumbency of some networks, certain inequities between the new networks and the incumbents will need to be accepted for a period of time, in order for that competitive marketplace to emerge in a meaningful way. As a practical/business matter, it is logical "free peering"/"bill & keep" interconnection relationships are formed when there are not substantial differences in the associated costs for Carrier A and Carrier B. However it is common that there are substantial differences in these costs for some period of time and they are either negotiated with money or time until parity can be achieved or new negotiations take place. Most importantly, as with other utility-interconnection issues, there exists an established non-discriminatory framework for these negotiations and the resulting interconnection agreements with time limits for specific phases, procedures for arbitration, required public disclosure and regulatory approval for the outcome.

In the context of peering, many mid-sized ISPs have currently or have been willing to build out their networks to exchange traffic with the largest networks in multiple geographically diverse points only to find that these larger networks will neither exchange traffic once these competitive networks have arrived at these points, nor will these large network operators even disclose under what criteria they would exchange traffic over these geographically diverse points. This refusal even to make public their criteria for interconnection is at the heart of a very serious threat to the continued growth and openly competitive nature of the Internet. It is also, as discussed below, illegal.

Under the Communications Act of 1934 As amended by the Telecommunications Act of 1996, "telecommunications carriers" are under obligation to interconnect "with the facilities and equipment of other telecommunications carriers..." (Act, Sec. 251 (a) (1)). A companion obligation under Section 251 (a) of the act is to "refrain from installing network features or functions that violate the guidelines and standards of Section 256 of the Act." Section 256 mandates "non-discriminatory accessibility by the broadest number of users and venders of communications products and services to public telecommunications networks used to provide telecommunications service." In Section 3 (43) In The term "telecommunications," as used in the Act means "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received." On a state level, the California Public Utilities Commission (CPUC) has made clear on numerous occasions that public telecommunications utilities must provide reasonable, non-discriminatory interconnection to other telecommunications carriers. (Decision No. 95-12-056 at page 16 issued in the CPUC's local competition proceeding, R. 95-04-043/I.95-04- 044 "We will review proposed interconnection contracts for unfair discriminatory terms and will deny approval or direct parties to renegotiate any unfairly discriminatory or otherwise unreasonable terms where necessary.")

The conduct of certain telecommunications carriers with regard to these current peering/interconnection issues also raise broader legal questions of antitrust. This is true, especially given that the most anti-competitive of these carriers are the very same telecommunications carriers that own and operate the IXPs in which most of the public and private interconnection/peering takes place. This is a situation directly analogous to the control of and manipulation of costs and flows in railway switching yards during an earlier "industrial" revolution. The behavior of the owners and operators of these yards were an integral part of the reasoning behind the creation of antitrust law in the first place. There too, economic justifications were made for the discriminatory and anti-competitive behavior of large business combinations.

The key to non-discrimination and open competition is disclosure. By definition, the non-disclosure of peering/interconnection requirements and agreements, especially the non-disclosure and fair application of criteria for establishing or maintaining peering between networks is the engine of this discriminatory and anti-competitive behavior. Many of us in this industry have heard for years from the largest networks in our business that they will not establish/maintain peering with our networks nor will they disclose their criteria for establishing or continuing peering. It is largely for this reason that I confess, I am a proponent of some level of regulation in the Internet as soon as possible. I think this minimal level of regulation is critical to the Internet's open and unrestricted development. As an entrepreneur and a professional in this indus-

try, I urge some minimal level of immediate regulation such that the application of accepted telecommunications law and practices are upheld. If they are not, I fear we will suffer the consequences of the accumulation of all the economic power over the Internet in to a very small number of hands. To me, this is a very big problem, perhaps one even worth losing your job over.

As these issues unfold, there are several arguments that will be used by those that resist what I am suggesting and I'd like to address them forthwith. As with all good arguments, there is some truth in what is said by those that see this issue differently. I submit that the facts are being manipulated to mislead the public, obscure the anti-competitive motives and cover-up the refusal to abide by the law which calls for non-discriminatory interconnection. By way of example:

1) It has been said that some ISPs are "looking for a free ride." This may be true of a few, though I know of none. The more relevant fact is that there are scores of mid-sized ISPs that are willing to pay or are currently paying all the costs required for interconnection at current or future traffic levels between them and those that claim that they are "looking for the free ride."

2) As ridiculous as it sounds I have heard it said that "Internet Traffic is not telecommunications, it is rather an 'Enhanced Service.'" This is particularly absurd in the light of the Telecom Acts definition of "telecommunications," which, as quoted above, by its own broad terms, easily covers Internet traffic.

3) I have heard that in order to negotiate these interconnection/peering agreements, it is necessary to enter into highly restrictive long term non-disclosure arrangements. The history behind the negotiation of interconnection does not support this view. To the contrary, this practice of enforcing "secrecy" will only result in discriminatory results.

4) It is argued by the largest ISPs that they are not telecommunications carriers and therefore under no obligation to interconnect with other ISPs, who likewise are not carriers under the Telecom Act. This argument lacks merit for two reasons. First the large ISPs making this argument are themselves wholly owned subsidiaries of self-acknowledged, FCC-licensed carriers. These ISPs are fully-integrated technically, financially, personnel-wise and infrastructure-wise, into their telecom corporate parent. No regulatory agency in the country would accept the fiction that the ISP "business" of the carrier is somehow separate and distinct from the telecommunications business of that same carrier. And, of course, from a marketing perspective, all these carriers are billing their Internet services as merely one element of their bundled, integrated service offerings. Second, the "you're not a carrier" argument can't apply to Whole Earth, because it is a licensed carrier — it has a Certificate of Public Convenience and Necessity (just like Pacific Bell/TCG, etc.) to provide facilities-based local and long-distance telecommunications services. Even if we didn't have this particular status it seems clear that the definition of carrier within the Telecom Act (above) would include all ISPs.

On a personal note, as some of you are aware there has been some turmoil over these issues for me and for Whole Earth Networks LLC. Words alone are not sufficient to express the appreciation I have for the support I have received from the employees, customers, friends and other industry professionals over these tumultuous days. Recently, the ownership too has been more supportive. I am beholden to all of you and simply can't express how deeply appreciative I am. These extraordinary circumstances have produced such unqualified support and admiration of my efforts in this area that I have been moved to tears on more than one occasion. I am thankful to the employees of Whole Earth for their commitment to stay at work and produce the services that we are all proud of. I remain convinced that Whole Earth Networks LLC is a company with a bright future which I endeavor to ensure.

David Holub is the (former) president, CEO and CTO of Whole Earth Networks. Mr. Holub, an entrepreneur and a recognized expert in telecommunications engineering, regulatory matters, Internet networking and UNIX system administration. He founded Hooked in 1993 and built the company into one of the most successful ISPs in California. Hooked was merged with the ISP business of The WELL in July 1996 and he was given the top job at what is now Whole Earth Networks. He has been responsible for virtually every management, technical, financial and marketing decision during the growth and development of these companies. Mr. Holub worked as a stocks and commodities trader with various Wall Street firms, he has served as a general partner for two funds. His hardware design, sales and marketing skills were honed at Tangent Computers. He was educated at the University of Wisconsin at Madison with majors in history and political science. ◆

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Notes From The Underground

by Wallace Wang

CULTS ON THE INTERNET

After 39 people killed themselves in an exclusive San Diego neighborhood, the media immediately latched on to the dual threat of cults and the Internet. If we don't regulate the Internet, the reasoning goes, who knows how many other innocent men and women might get seduced into joining an organization that takes away all their money and tells them how to think. (Of course, we have groups that do that already, but we just call them the Republican and Democratic political parties.)

Although the Heaven's Gate cult staged the largest mass suicide in American history, they will more likely be remembered for their use of the Internet. Not only did Heaven's Gate have their own web site (`www.heavensgate.com`) or the mirrored site at (`www.artbell.com/heavens.html`), but they used the Internet as a recruitment tool to attract new members.

For the first time, cults like Heaven's Gate could use the Internet to reach a global audience. With such rapid, worldwide communication available to anyone able to afford **$19.95** a month for Internet access, what other horrors might the Internet spring on an unsuspecting public?

But while computer-savvy users know that the Internet played no more a role in the mass suicides than did the makers of Nike tennis shoes (which all the cult members were wearing when they died), technophobic people might be surprised to know that cults have played a continual role in human history whereas the Internet is only a recent phenomenon.

CULTS THROUGHOUT HISTORY

One of the more prominent cults was Christianity itself, whose members were routinely tossed to lions or crucified for the amusement of the general public. Today, of course, Christianity has risen above the level of cult status, which leads one to believe that the only difference between a cult and a church is the number of people involved. But aside from organized religion, perhaps the most famous cult of all time was the Order of the Knights Templar. (Visit `www.cnct.com/home/grantf/main.htm` for more information.)

The Order of the Knights Templar began as an army of Christian knights who protected pilgrims during the First Crusade as they invaded the Muslim lands. (Sound vaguely familiar?) To oppose the Knights Templar, the Muslims formed a similar fighting organization dubbed the *Assassins*. Supposedly, the Assassins were such fearless fighters because they smoked hashish to glimpse heaven before battle. After recovering from the effects of hashish, an Assassin would gladly give up his life to allow death to return him to the heaven he had glimpsed during his hashish session. In fact, the word *assassin* is derived from the Arabic word that means "hashish smoker."

While the Assassins and the Knights Templar battled one another for control of the Holy Land, most of the Knights Templar took a vow of poverty and turned their money over to their Order, which made the Order of the Knights Templar one of the wealthiest organizations in Europe.

The immense wealth of the Knights Templar attracted the greed of many others, including the King of France, Philip the Fair. To get at the Knights Templar's money, only one crime allowed a king to confiscate property, and that was heresy. So Philip arrested all the Knights Templar in France and tortured them until they confessed to worshipping the devil and participating in homosexual orgies. By 1314, the last of the Knights Templar was burned at the stake—and not one of them had been given a chance to design a web site or recruit new members through Usenet newsgroups or IRC chat rooms.

DEATH CULTS TODAY

While stories about the Assassins and the Knights Templar provide a historical background that makes for scholarly reading and interesting speculation, most adults are worried about cults that their children (or loved ones) might get involved with today.

Before Heaven's Gate stole the headlines, The People's Temple took the spotlight, led by Jim Jones, who developed a belief called *Translation* in which he and his followers would all die together and move to

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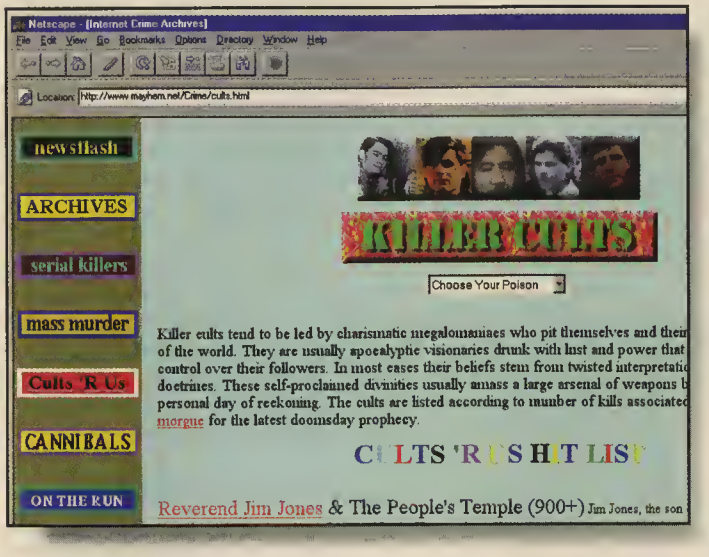
another planet for a life of bliss. When rumors of human rights abuses circulated, Congressman Leo Ryan decided to visit Jonestown for a personal inspection. Unfortunately for Congressman Ryan, some People's Temple members wanted to leave Jonestown and return with him to the United States.

While they were waiting at the local airstrip, some heavily armed members of the Temple's security guards arrived and started shooting, killing Congressman Ryan and four other people. Fearing retribution, Jones ordered his entire group to commit suicide by drinking cyanide-laced Kool-Aid, killing 638 adult followers and 276 children.



Since death cults are likely to become a part of our culture like The Beatles and the Apollo moon landing, visit `www.mayhem.net/Crime/cults.html` or `www.religioustolerance.org/acm.htm`. Here you can read about other cults with names like the Order of the Solar Temple, The Church of The Lamb of God, and The Temple of Love. Reading the information on this web site can teach you that nearly all cults sport the following characteristics:

- A charismatic leader who often claims to be Christ (how come nobody ever claims to be Newt Gingrich?).
- A belief that the end of the world is near, as if the Apocalypse schedules its timetable according to the arbitrary measurement of time defined by our calendar system.
- A community where members live together in near isolation from others including families and friends.
- A mixture of beliefs derived from Biblical and New Age sources.

Cult members also tend to exhibit another curious characteristic in that they lose their sense of humor, so if anything in this column angers you, maybe you're involved in a cult and don't even know it.

In the case of Heaven's Gate, Marshall Applewhite (nicknamed "Do," although a more appropriate name would have been "Duh") claimed that he arrived on Earth from a UFO and incarnated in the body of Jesus Christ (Characteristic #1). Marshall convinced his members to share living quarters (Characteristic #3) where they would await the proper time to return to the Kingdom of Heaven (Characteristic #4).

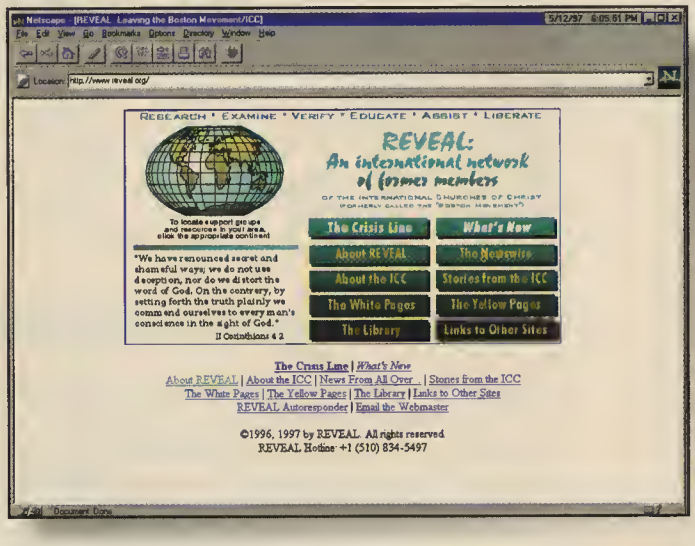
To prepare for this journey, male members castrated themselves, apparently in the belief that they had to pack their testicles as carry-on luggage for their intergalactic journey to heaven. When rumors circulated about the arrival of a UFO hiding behind the Hale-Bopp comet, Marshall convinced members that this was the sign (Characteristic #2) that they needed to shed their bodies so they could board the UFO and leave the material plane behind.

WHAT YOU CAN DO

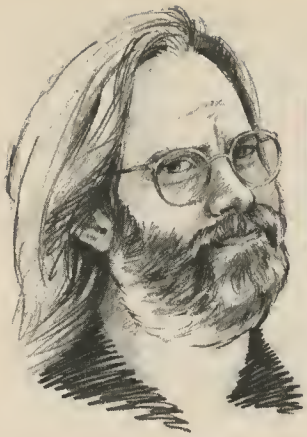
So if you suspect that a friend, relative, or loved one (since relatives aren't always loved ones) has joined a cult, what can you do? Before rushing to their defense, consider your own definition of a "cult." To some people, the Boy Scouts could be considered a cult. To other people, Heaven's Gate could be considered a valid religion.

Since you can never "save" others (especially if they don't want to be "saved"), your first line of defense against cults is to avoid them yourself. Just keep in mind that many organizations offer characteristics of cults such as charismatic leaders (the United States government with Bill Clinton), a belief that the world is going to end soon (your local church), an isolated community (any Catholic boarding school), and a mixture of Biblical and New Age beliefs (any group of more than three people in California).

To see how one group is using the Internet against a group called the *International Church of Christ* (ICC), visit the REVEAL (Research, Examine, Verify, Educate, Assist, Liberate) web site (`www.reveal.org`). Here you can read testimony from former members, visit links to anti-cult support groups, and view lists of books and other resources so you can educate yourself. Or visit the alt.support.ex-cult Usenet newsgroup and share your thoughts with others.



Since defining a cult can be tricky, take some time to learn all you can about any particular group and about cults in general. The definition of a cult can apply to nearly any organization, so don't be too quick to label any group a cult too soon. If you think you know the "right" way people should think, live, and act, then congratulations! You've just qualified yourself to lead your own cult. ◆



Java Jitters

by Doug Shaker

WHEN THE JAVA POOBAHS MEET, THERE'S ONE WHO HAS HER CREDENTIALS

Lately, I've seen Kim Polese's face all over the place. She's president of a Java-oriented software company called *Marimba* (`www.marimba.com`). She's been interviewed by *Wired, Time, JavaWorld, SunWorld*, and heaven knows who else. I did a web search on her name and came up with 824 references. The last week in April, she was listed in *Time* as one of the "25 Most Influential Americans" – along with Rosie O'Donnell, Don Imus, Dilbert and Secretary of State Madeleine Albright.

Doug Shaker is a freelance technical writer in California. He has one wife, two children, three pets, and five computers. The computers are obviously out of hand. He can be reached via e-mail at **mailto: doug@theshakers.org**. Yes, that is a personal Internet domain. We told you the computers were getting out of hand.

Even if you know nothing about Marimba and Polese —you will soon—let us pause for a moment to consider the absurdity of a list that equates talk show hosts, cartoon characters, and the head diplomat for the most powerful nation in the world. Madeleine Albright can start or stop global conflicts by directing the might and influence of the U.S. government. After the President of the United States, she is arguably the most powerful person on earth. Then we have Dilbert. Now, umm, Dilbert —well, what *can* Dilbert do? He does know what a jerk his pointy-haired boss is and his dog *may* be ruler of the galaxy at some point, but influential? Then we add to the list some talk show hosts and the president of a little Internet software company and the whole idea becomes pretty bizarre. Still, I suppose it is possible that Polese is roughly as influential as the average of Don Imus, Dilbert, and the Secretary of State. Calculating that average is pretty hard to fathom, though. It's kind of like saying that a beetle is roughly as intelligent as the average of Jerry Lewis and a rock. Still, I suppose it sells magazines.

Marimba has two products. As always, in this great age of market share first, profits later, evaluation versions are available for free, on the Net at `www.marimba.com/products.download.html`.

The first product is a more or less ordinary Java interface tool called *Bongo*. I haven't used it, so hell, maybe it's great. It might be the most wonderful piece of software in the known universe, but it's lost in the noise of all the Internet blab on Java tools. Lots of people have Java interface tools—use the one you like.

The principal tool that Marimba sells is *Castanet*.

Now let's stop for a moment to consider the modern era in software names. They seem to all be based on puns or on coffee metaphors. Marimba's pun— "cast a net" vs. those clicky things that flamenco dancers hold in their hands—isn't too bad. Sometimes I think that the puns have gone too far. Still, I am as susceptible as anyone. At one point, I did a business plan for a firm to do catalog software. I wanted to call it "Feline Timber" to pun on *cat* and *log*, but luckily my partner overruled me. Even Feline Timber is better than the stupid "techno" names that flourished ten or twenty years ago. Back then, the more Qs, Xs, and Zs you had in your name, the better. Back to our punny software, Castanet.

If you build a Java application with Castanet, the Java application knows where it came from. That is, it knows what Internet server it was downloaded from. The application knows how to go update itself from its parent server. The update may be any kind of object that makes sense—behavior (programming) or content (data). If the application was your application and you found a bug in the program, you could create a new version of the buggy class, put it on the server, and your Castanet applications would come get the new class, install it on their disk, and be updated. If you wanted to broadcast information to your users, you could create some new data objects to hold the information and the programs would come get the new objects, download them and display them.

The original idea behind all this was "push" technology—pushing information across the Internet onto your workstation. Your application would be an information channel—like a TV cable channel—and people

would get an application (called a *tuner*) to get access to the channel. There are a few Castanet tuners like this—check out `www.marimba.com/channels` for a list of channels. But, to tell you the truth, I'm not so crazy about this kind of channel. I have a TV and a newspaper and those do a perfectly good job of getting me sports scores, crossword puzzles, horoscopes and all the rest of that crap that hangs around the back of newspapers and wastes my time while I drink my coffee. If I want to waste my time on the Web, I have quite enough ways to do so with my existing web browser, thank you.

I think the real use of tuners and channels is to give corporations access to applications that update themselves. I don't know if you have ever worked in a large corporation, but doing software maintenance in those places is a bear. Most of the time, you don't even know where all the PCs are, let alone which ones have which versions of which word processor. If word comes from the outside world that WordKing 2000 has a bug in it that will wipe out everyone's memos on Friday, you don't have any better way of doing the updates than to walk the halls, looking in every office, turning on every computer, and looking around. God help you if your boss's boss's boss has his laptop with him on a road trip, you miss the update, the software fails, and he loses his only draft of the Filbert contract. If that word processor, the mighty WordKing 2000, was a Castanet application, it could go find its own updates the instant the application was started. The laptop software would get its own update when your boss's boss's boss plugged into the Internet.

"I think the real use of tuners and channels is to give corporations access to applications that update themselves"

Yes, automatic updates is a big sell for large corporations—corporations will *love* this stuff. And we aren't just talking about word processors, either. How many Amoco geologists, do you think, use in-house programs to analyze oil field and exploration data? How many people at General Motors are using special purpose CAD programs? Just how many programs like this are there in the universe? Thousands? Millions? All of those programs need to be updated every time a bug is found or the operating system changes.

Think about this as a business opportunity, if you want to start a business. Right now, there aren't any Java-based word processors, any Java-based project management utilities. They *all* have to be built. If they are built on Java and Castanet, they will work across platforms and will update themselves. It is a wide-open market. Think about it.

Castanet is an great idea that uses the Internet in a relatively new and valuable way. If Marimba can attract and keep developers interested in Castanet, they should be a big success.

The bizarre thing, about all this, at least for me, is that I know Kim Polese. In fact, I used to be her boss. In 1984, I worked for an artificial intelligence (AI) company called *IntelliCorp*. I was the head of the support department and then, later, the honcho to which the Customer Support Manager reported. Kim hadn't been out of college long and was looking for a job. Her previous job was at a local science museum, helping kids learn to program simple robotics systems. It really wasn't much background for an artificial intelligence company, but this was the AI boom and the people who really *knew* something about AI were getting huge salaries and starting companies. Those of us who were smart and willing to read AI books were getting jobs doing AI. Kim was smart, articulate, knew something about computers, and willing to work hard. That was good enough and we hired her for the support department.

She turned out to be relatively good at it. In those days, we assigned each support representative a list of customers. You not only took calls from those customers, but you called them up and made sure they were doing OK. They were your customers and you had to take care of them. Kim was concerned about her customers and went to some lengths to make sure they were successful.

Once a year, IntelliCorp had a users' group meeting. This meeting was a big pain in the rear to put together, because there really wasn't a users' group. That is, there was no organized group of users that had spontaneously come together and could be depended to help out with the meeting. There were, however, a few hundred people who were willing to come to California and eat doughnuts while they listened to talks that IntelliCorp had put together for them. Someone, an IntelliCorp employee, had to do all the scut work associated with the users' group meeting. They had to rent hotel space, borrow machines from the computer companies, find speakers, arrange for machines to be moved, put together flyers, call to see who was coming, put together agendas, find demos, order food. It was horrendous.

Of course, we didn't have a person whose job it was to do any of this crap. We just picked someone out of the Support department and said "You do it. Please? Pretty please? Pretty please with sugar on it?" One year we got Kim to do it. She busted her tush that year, working 16 hour days for weeks on end, fretting, sweating and pulling the users' group meeting together. I don't recall how successful the actual meeting was—a great triumph or just plain good—but I do remember that she was very, very nervous before the meeting and very, very tired afterwards.

At that time, IntelliCorp didn't do much in the way of bonuses for gut-wrenching amounts of work. To compensate, I made up a custom that was pretty silly, but seemed to work as a way of recognizing extraordinary employees. I had a few black satin jackets made up with the words "Grand Exalted High Poobah" embroidered on the back in purple. I saved them up, and when someone did something way above and beyond the call of duty, I gave them a Poobah jacket. Usually, there was a noisy, grand and silly ceremony to go along with it. That year, Kim got a Poobah jacket. She had clearly earned it and my guess is that she still has it.

Now, Ms. Polese is president and CEO of Marimba. Not so amazingly, Marimba just happens to have an a extraordinarily good developers' program which takes into account the fact that all developers are not huge corporations. Some options, the free ones, seem to be designed for small software companies with one or two programmers. And, no surprise, they have a well-developed net of Marimba users' groups with no less than six local chapters. Developers who commit to organizing and running a users' group for a year, get a free copy of the Castanet software. It's more than a decade later, and it seems to me that Kim is still interested in customer success and doing her darndest to make sure it happens. My guess is that she and Marimba will succeed. ◆

CYBERWORLD MONITOR

Frank X. Sowa

... AND THEN THERE WERE TWO ..

A "techtonic" shift took place in January—and no one apparently noticed. When Apple Computer announced its plans to abandon its proprietary Mac kernel for a Mach UNIX kernel, the battle for the hearts and souls of computer users, network administrators, and developers moved away from desktop computing—toward two network-based camps—those who cherish the cross-platform capabilities of UNIX to serve—Windows, Macintosh, and UNIX over the Internet and Intranets; and those who are focused on supporting and growing the dominant-Microsoft Wintel desktop-based architecture as the enterprise system of choice.

As a survival strategy, IBM is now firmly committed to both the UNIX and Wintel camps. Touting Windows NT as the "operating system" of the future, IBM has announced it intends to support Windows NT in all future software. IBM has also joined Microsoft and Intel in creating new e-mail standards called *Business Quality Messaging* or *BQM*. At the same time IBM has formalized closer relationships with Sun, Novell and Oracle. It has also touted Sun's Java programming technology over Microsoft's Active X. In addition, this year IBM, also joined with DEC, Oracle, Apple and Netscape to promote common development standards for object technology that would allow customers to mix and match network computing software from any of the companies, a move aimed at slowing Microsoft's momentum in the client/server market.

OPEN PLATFORM CAMP DRIVEN BY SUCCESSES VIA THE INTERNET

The open platform UNIX camp is driven by the successes of Sun Microsystems, Netscape, DEC, Apple and Oracle. Sun's UNIX-based servers run 53 percent of the networks that make up the Internet, while its microprocessors power its own, and others' workstations and servers. In all, UNIX servers run 64 percent of the Internet's networks.

Sun is attempting to grow their network presence with Java—the open platform programming language that takes the complexity off of the desktop and puts it back on the server. With the release of the easy-to-learn, platform-independent Java programming language, many experts are already touting that Java will radically change computing by allowing software applications to be downloaded from the Internet, and by allowing the Internet/Intranet paradigm to include smart telephones, set top boxes and other small appliances—even nanotechnologies.

About 10,000 developers attended JavaSoft in early April, roughly twice the number of attendees in 1996. JavaSoft expects about 600,000 people will be developing Java by the end of this year—approximately three times last year's number. Sun's "Java everywhere" strategy intends to implement the cross-platform programming language on everything from desktop computers and web servers, to smart cards and household appliances, to enterprise systems and groupware products that run corporations.

Sun's Java initiatives—backed by the open-platform camp, have so threatened Microsoft's market dominance that CEO Bill Gates has jumped on the growing Java bandwagon, agreeing to add Java code to the next version Windows 95. Java is also incorporated in the Netscape web browser and is part of a standard established by several industry leaders for "network computers," inexpensive machines to be used solely for Internet access.

DOMINANT WINTEL CAMP DRIVEN BY HOLD ON DESKTOP

The proprietary Wintel camp is dominated by Microsoft, Intel and Compaq. Microsoft's strategy "Windows everywhere" (Sounds the same, doesn't it?) remains the driving force of decisions made in Redmond.

The basis of this strategy is for Microsoft to closely guard its desktop system advantages and keep its vise-lock on the computer industry for as long as it can. Compaq, meanwhile, is working to impress upon users that it has become a serious player in the networking market.

Microsoft, Intel, and Compaq have also announced they are working with other firms to develop an industry-wide specification to improve the way customers purchase, install and upgrade PCs and PC devices. The effort is expected to be supported in future Intel chipsets and related products, future versions of Microsoft Windows and Windows NT operating systems and future Compaq computers.

One of those improvements will be seen in June, called the *Device Bay initiative*. The companies said the Device Bay effort will allow for interchangeable peripheral devices, such as hard disk drives, modems, network adapters, CD-ROM drives, DVD-ROM drives and a variety of other electronics devices on all Windows, Windows 95 and Windows NT machines.

Earlier this year, in response to Oracle and the open-platform camp, Microsoft, Intel and Compaq officially released their vision for a class of simplified computers. Calling it the *NetPC*, a response to the "network computer," or NC, concept, the NetPC is designed to reduce ownership costs by offering new and advanced network-management features.

The "Windows everywhere" approach seeks to counter any anti-Windows incursions wherever they take

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franksowa@aol.com

place by offering an alternative Wintel-based device, or by assimilating the companies that hold competing patents (as Microsoft did recently with WebTV). The Wintel world's biggest advantage is a huge array of software that only operates with its Windows operating systems on Intel processors.

Ironically, Microsoft now retorts, when questioned about its proprietary platform, that software tuned to a specific operating system has big performance advantages, and companies are in no hurry to throw out what works well. In the past, that was always Apple's retort to Microsoft when the Wintel world argued that the Macintosh was too platform specific.

BATTLE LINES NOW MOVED TO JAVA VERSUS ACTIVE X

The open-platform camp in April provided new ammunition to try to weaken Microsoft Corp.'s influence over the industry's technical standards. Just days after Microsoft approached the American National Standards Institute (ANSI) to adopt ActiveX as a "national standard" for desktop computers, Sun announced that the International Organization for Standardization (ISO) in Geneva, Switzerland would accept Java, a direct competitor to Active X as an "international standard" for computing devices, and make Sun's JavaSoft subsidiary the certifying body.

Earlier in the year, Sun, IBM, Netscape and Novell launched a "100 percent pure Java" branding campaign aimed at ensuring that Java retains its ability to work on multiple computer systems. The initiative was also designed to keep Microsoft—or any other licensee—from appropriating the technology, and rewriting it in a proprietary fashion to only work on its platform. Which is exactly what Microsoft was doing with Visual J++.

The volley disrupted the strategies of Microsoft. Up to that point, the battle was mainly focused on PCs connected to the Internet's World Wide Web. Java, as most *Boardwatch* readers have experienced, adds a lot of dynamic capabilities to web pages.

But, Sun has escalated its assault on Microsoft's proprietary platform by encouraging developers to consider using Java for complex programs that can run companies' manufacturing, order entry, customer service and other heavy-duty commercial jobs—applications specifically tied to Wintel's successes with Windows NT. Besides targeting servers, Sun also announced the "JavaPC," expected to be available in the fall for less than $100, that allows Java to run on low-end desktop machines that use Microsoft's DOS operating system. Other variants called *PersonalJava* and *EmbeddedJava*, are designed for TV set-top boxes, video game machines, fax machines, factory automation and networking devices. Many manufacturers of non-computer products are eager to use a standard language that communicates easily with other devices, in place of proprietary technologies.

WHAT THIS MEANS FOR ISPs

Sun's Java enterprise strategy appears to be a major breakthrough for a new paradigm in network computing. The strategy is to make the same program run on any server, whether it is using a UNIX-variant like Sun sells, a Macintosh server, or Microsoft's fast-growing Windows NT system. "Java will really be the vehicle for getting developers off the Microsoft heroin and on to a more open platform," Alan Baratz, president of Sun's JavaSoft subsidiary, explained.

Baratz's comments caught the ire of Microsoft's chairman Gates. "There's nothing you can do in Java that you can't do in C," he was quoted as saying angrily in response to a reporter's questions regarding Java. "We don't see any reason to rewrite our applications for the sake of rewriting them in Java to have them run slower," he added.

In reality, Java has its critics. Many of them are from the Wintel empire. To developers at this point, Java is just another programming language. Sun's big idea may be a revolution in computing, but until object-oriented software tools for developing Java applications are available, the revolution won't happen.

Luckily, for Sun a number of tools are finally starting to appear on the market. These include Sun's own workshop product, ParcPlace-Digitalk's Visual Tool Boxes, Symantec's Visual Cafe, IBM's VisualAge, Borland's Latte, and Microsoft's Visual J++. And, hidden in the Rhapsody development at Apple, may perhaps be the easiest to use Java toolkits that will hit the market. With these tools, developers expect that Java will do for the Internet/Intranet what Visual Basic did for Windows.

MICROSOFT'S COUNTERATTACK

Microsoft lost its initial battles with Sun over Java as an industry technical standard. To counterattack, Microsoft quickly changed its approach vowing to support Java as a "development tool."

The software giant continues to emphasize technologies that run best on its Windows system, while gearing up to compete with Java products that run on any computer. Microsoft said they are "committed to supplying the industry with the best possible tools for Java development," taking the Java battle to Sun's home turf by demonstrating a Java toolkit for developers, called "application foundation classes," running on Sun's version of UNIX as well as Microsoft's Windows 95 system.

Microsoft is committed to being a major provider of Java. But, at the same time Microsoft, with its release of the Visual J++, continues to attempt to pull in developers to its Active X product. (A free trial edition of the product is available at `www.microsoft.com/visualj`).

According to developers, ActiveX at this point, is better than Java—as it can integrate well with any scripting language, application, and operating system. More importantly, it now features multi-platform capability with support for Solaris, UNIX and even LINUX. But, Sun asserts that very soon, Java will be the clear leader, making it easier to write programs that run on a variety of different computers and operating systems, as well as on other devices.

JAVA AND ACTIVE X WILL BE AN IMPORTANT PART OF YOUR FUTURE

Analysts say big companies are studying Java very closely, particularly for applications where they want to transfer software over the Internet to customers and suppliers. They say that over 65 percent of the Fortune 500 companies have plans to implement Java into their enterprise systems in 1997. Sun says it will move to build on the momentum behind its Java computer programming language despite overtures by Microsoft to co-opt Sun's initiative.

Microsoft understands the obvious potential threat Java poses to the Win 32 platform. That's why Microsoft executives spend as much time as they do challenging the Sun's the licensing body in charge of Java. Microsoft sees its proprietary code is the common thread to the revolution of desktop, entertainment and network computing. Open platform products like Java could undermine that vision. ◆

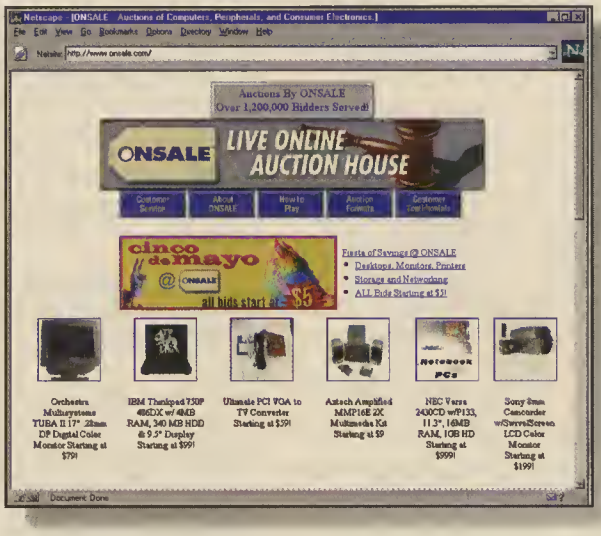
MANNING THE WIRES

by Ric Manning

HIGH-TECH AUCTION HOUSE IS THRIVING ON THE WEB

Out of all the new Internet start-up businesses rushing to Wall Street this spring with new stock offerings, one business stands out from the rest: Onsale, Inc. isn't losing money. The web-based auction house finished 1996 with net income of **$361,000** on revenue of **$14.2 million**.

Onsale (`www.onsale.com`), based in Mountain View, California, appears to be the most successful of a new group of web services that sell merchandise through an electronic auction.



In addition to Onsale, at least two other web sites specialize in auctioning computers and other high-tech gear: Cybersale (`www.infopoint.com/auctions/cybersale`) and Cyberswap Auction House (`www.cyberswap.com`), a subsidiary of the ACP Superstore retail chain in Santa Ana, California.

Onsale was founded in 1995 by Jerry Kaplan, former chairman of Go Corp., one of the early promoters of pen computing systems, and Alan Fisher, former chairman of Software Partners, Inc.

Onsale works like this: when customers enter the web site, they immediately see a list of products that are on the block. Items include computers, peripherals, audio and video gear, and home office equipment. Most of the items are refurbished and closeout products from name brand manufacturers such as Packard Bell and Panasonic. Prices usually range from **$50** to **$5,000,** but last year Onsale sold an IBM mainframe computer for **$12,250**.

Once they are registered with Onsale, customers can bid on the items offered for sale. A recent sale offered 25 IBM Thinkpad laptops for sale with the bidding starting at **$99**. Click on the item and you check a list of the top 25 bidders along with their prices and comments. If the low bid for the PC is **$349**, then you can immediately see what it will take to get in the running.

Customers register their e-mail addresses along with their bids. If someone enters a higher bid that pushes you off the list, Onsale will notify you and give you a chance to reply with a higher bid.

Onsale uses contests and giveaways to pump up enthusiasm and it encourages bidders to add witty comments to their bids to help make the process a little more human and friendly. Onsale says it has more than 100,000 registered bidders. It sells about 4,000 products each week and pockets commissions of between 10 and 20 percent.

At Cyberswap, bidders are asked to enter their credit card numbers online, or fax a form to ACP's store. Bids are closed twice each week. In addition to computer hardware, Cyberswap sells software. Bidding for games and other CD-ROMs usually starts at about **$5**. Business and programming software might go for about **$20**.

Cybersale operates in a similar manner with new items posted every week. Bidders are asked to register before bidding or to fill out a form when they place a bid.

Although Onsale is the first of the Internet auction sites to go public, several analysts see a bright future for electronic auctions. The Internet is particularly well-suited to auctions, they say, and some big-name retailers may soon decide to get in.

Onsale's Kaplan says his customers enjoy the same "thrill of the hunt" that come with auctions in the real world. It's fun to both find a bargain and beat someone to it.

NEW FEES AT NET BANK

The Internet's first full-service bank is starting to look as ordinary as the bank down the street. Security First Network Bank (SFNB) "Manning the Wires," Jan. 1996) attracted more than 10,000 customers in a year-and-a-half in part because the bank charged no monthly fees or transaction fees.

Ric Manning is a columnist and web master for ***The Courier-Journal*** in Louisville, Kentucky. His weekly column covers computers, consumer electronics and the Internet and is distributed to more than 100 newspapers by the Gannett News Service. It's also available on the World Wide Web at **http://courier-journal.com/gizweb**.

Ric was the founding editor of ***Plumb*** and ***Bulletin Board Systems,*** two newsletters that covered the BBS arena in the early 1980s. His freelance work has appeared in several magazines including ***PC/Computing, Mobile Office, PC Week*** and ***Home Office Computing.*** Ric lives in Southern Indiana with his wife, two children and two Weimaraner dogs.

CEO James Mahan said the bank could be profitable without charging fees because its operating expenses were so low. While other banks had to spend a dollar to process a transaction with a human teller or 25 cents for one at a cash machine, Mahan said transactions on the Internet would cost about 2 cents.

That was apparently not low enough. On June 1, SFNB instituted a new set of requirements for customers: make a direct deposit at least once a month, keep a minimum balance of **$1,000** in your account or pay a **$3.95** monthly service fee.

ONLINE LOANS

A Virginia-based mortgage company says it can process online home loan applications in a matter of minutes.

American Finance and Investment Inc. (`www.loanshop.com`) says it uses artificial intelligence software to analyze applications. The system compares data entered by an applicant with information from past loan applications to determine if an application should be approved, rejected or put aside for further review. Applicants who are approved can print out a certificate that states their line of credit that they can show to a seller when making an offer on a home.

NET ECONOMY CREATES JOBS

More than 1 million people got new jobs last year because of the Internet, according to a report by the Global Internet Project of the Information Technology Association of America.

The Virginia-based a trade group produced a study called "The Emergence of a Networked World" that said the skeptics who ask where the profits are from online businesses are jumping the gun.

"There is no such thing as an Internet-based business more than two years old," the report points out. "In fact, almost all of the current estimated 250,000 commercial World Wide Web sites have been in operation less than a single year."

Nevertheless, many Net businesses are already doing well. The report cites a June 1996 study of 1,100 web-based companies that found that more than 30 percent had reported profits.

"Follow the money," the study said. "Internet businesses attracted **$42 million** in venture capital in 1994. In just the first three months of 1995, the figure was **$47 million**. Internet retailing, especially for well-known commodities people don't need to see and touch before buying, is particularly strong and promising. The Internet will sell more than **$500 million** worth of products in 1996 — and more than **$6.6 billion** by 2000." ◆

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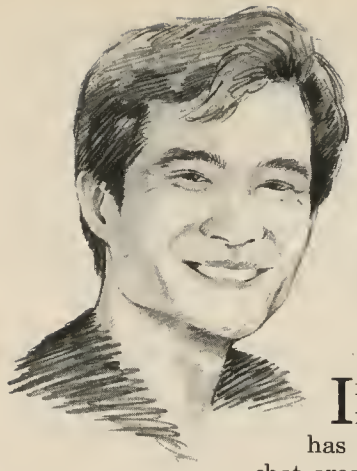


BIG BOARD BRIEFS by Wallace Wang

EXPECT MORE ADVERTISING ON AMERICA ONLINE

In an effort to generate more revenue from online advertising, America Online has opened its "People Connection" online chat area to advertisers. Ads will appear in the public, but not private, chat rooms and will change every 60 seconds.

"We think this opportunity will appeal to smart marketers who currently spend significant advertising dollars on television," observed Myer Berlow, America Online's senior vice president for interactive marketing. While online advertising may become the next advertising battleground, smart advertisers also know that the analogy isn't quite accurate. After all, people don't have the same trouble accessing TV channels like they do America Online.

Wallace Wang is the author of ***CompuServe For Dummies, Visual Basic For Dummies, More Visual Basic For Dummies, Microsoft Office 97 For Dummies,*** and ***More Microsoft Office 97 For Dummies.***

When not working with computers, he performs stand-up comedy and has appeared on A&E's *Evening at the Improv* TV comedy show. He can be reached via e-mail at 70334.3672@compuserve.com, bothekat@aol.com, bo_the_cat@msn.com, or bothecat@prodigy.net

COMPUSERVE BATTLES TIME MAGAZINE

Continuing the bungling of its once-proud online service, CompuServe is now involved in a lawsuit with *Time* magazine. CompuServe once paid *Time* magazine millions to defect from America Online in the hopes that *Time's* presence would help attract new (and retain current) subscribers. After nearly everyone flocked toward flat-fee Internet access, CompuServe decided it didn't want to keep paying for *Time Magazine's* existence after all.

Now *Time* magazine is suing CompuServe for **$3.5 million**, charging that CompuServe still owes additional payments within the terms of the original contract. Whether CompuServe or *Time* wins seems irrelevant at this point. While CompuServe's executives haggle over the confusing legal terms written in the contract, the fact remains that CompuServe's proprietary content is fast dwindling away. Look for CompuServe to be an empty shell of itself within another year or two.

SPORTS ILLUSTRATED AND PRODIGY OFFER FANTASY BASEBALL GAME

Think you can run your favorite baseball team better than the professional managers? Then join Prodigy and *Sports Illustrated* to play a fantasy baseball game called *Baseball Manager*, available by subscription to anyone connected to the World Wide Web.

Sports Illustrated has agreed to market and promote Baseball Manager (BBM) on its own SI Online web site (`www.sportsillustrated.com`) and in *Sports Illustrated* magazine, read by more than 23 million adults each week (and a whole lot of teenagers when the swimsuit issue appears). Prodigy subscribers can reach Baseball Manager by using the GoTo command: bbm.

Baseball Manager allows game players to manage teams comprised of big-league players. (Watch out for players spitting on the umpires.) Baseball Manager lets players set daily line-ups, pitching rotations, select relief pitchers, make trades, send players to the minors, even define lefty versus righty match-ups. Each morning, BBM generates daily results for thousands of cyber teams — win or lose — based on player performances that took place in Major League stadiums just hours before.

Using a sophisticated algorithmic formula that weighs real-life offensive, defensive and pitching statistics, BBM's powerful mainframe-based game computers crunch numbers from the prior night's games, deciding winners and losers based on each fantasy team's performance. When BBM game players sign on to the web site, they receive their own daily, personalized results, including computer-generated newspaper headlines trumpeting scores and performances from the previous night's cyber games. Just as in real baseball, this process unfolds over the course of a 162-game schedule and culminates with playoffs and a Cyber Series to determine the champions of the Internet.

AMERICA ONLINE OFFERS OKLAHOMA CITY BOMBING TRIAL

Seeing how the ratings skyrocketed for the O.J. Simpson trial, America Online is hoping to capitalize on the public's insatiable curiosity for legal battles by launching a special section devoted to the Oklahoma City bombing trial.

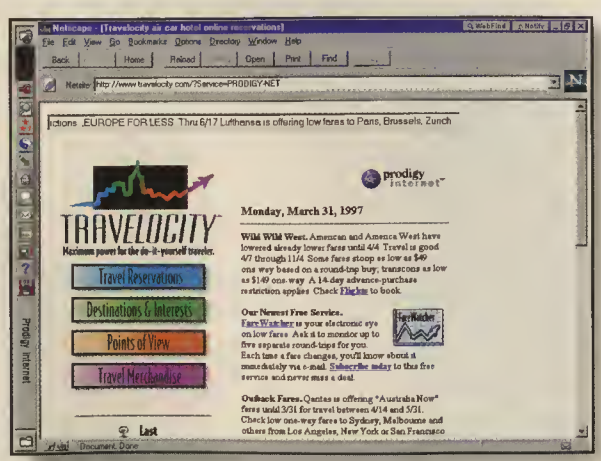
This section, accessible to America Online members at keyword: DENVER, will include news reports from the trial of Timothy McVeigh (the main suspect in the April 1995 terrorist attack that killed 168 people), along with a history of the case, message boards and chat rooms so members can toss in their own ideas on the progress of the trial.

For those people who really want to dig into the details, full text of legal documents filed on both sides of the case also will be available. If you don't belong to America Online, you can still follow the trial, minus the message boards and chat rooms, by connecting to the Web at `denver.digitalcity.com/bombing`.

PLAN A TRIP WITH PRODIGY

Prodigy and The SABRE Group have teamed up to offer the popular Travelocity site to Prodigy Internet members. Travelocity, powered by the SABRE computer reservations system, allows Prodigy members to book their own airline reservations and receive their tickets overnight along with a printed itinerary.

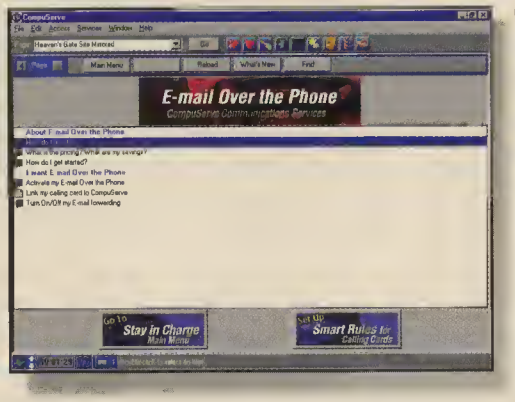
Besides letting you tap into the same computers that the airlines use to make reservations, Travelocity also lets you make reservations for more than 34,000 hotels and 50 car rental companies through the SABRE reservations system. This reservation capability is paired with a vast database of travel information including guides to 22,000 destinations worldwide, details on 9,500 restaurants, 1,400 museums, 11,000 bed and breakfasts, 3,000 theater, dance and music performances, 4,500 condominiums, 13,000 golf courses, 30,000 hotels and thousands of exhibits, shows and festivals.



For bargain hunters, Travelocity offers an exclusive Three Best Itineraries/Low Fare Search Engine that automatically searches for the three lowest fares based on the traveler's criteria. So if you're looking for a low-cost fare to Bosnia, Zaire, or Libya, then let Travelocity help you plan your next trip today.

HEAR YOUR E-MAIL WITH COMPUSERVE

If you have a touch-tone telephone and a CompuServe account, you can now retrieve your e-mail through the nearest telephone. All you have to do is dial CompuServe's toll-free number, type in your access number, and a recorded voice on the other end tells you if you have e-mail waiting. If so, press 1 to listen to CompuServe's computers read the message to you over the phone. If you think a computer can't speak very well, call **(800) 326-0341** and listen to a sample recorded message.



Once you've listened to your messages, you can tell CompuServe to fax the message to you or send a canned response back to the sender. For those people who absolutely must use the latest technology to receive their e-mail at all times without a laptop computer, use the GO HEARMAIL command to learn more about CompuServe's latest attempt to offer new services to its dwindling membership.

Fortunately, CompuServe's talking e-mail service doesn't require a monthly or annual fee. The service does cost **$0.25** per minute, so if you regularly receive lengthy e-mail messages, it might actually be more cost-effective to hire a secretary to read you your messages over the phone instead.

PRODIGY EXPANDS AFRICA ONLINE

Still searching for new markets that rival online services have persistently ignored, Prodigy has announced that it is spending **$12.5 million** to expand its Internet presence in Africa. In case you didn't know, Prodigy has a subsidiary called *Africa Online*, which operates offices in Nairobi and Mombasa, Kenya; Accra, Ghana; and Abidjan Cote d'Ivoire.

By the end of this year, Prodigy and Africa Online plan to expand to Tanzania, Uganda, Egypt and South Africa. Since it began offering full access to the Web in early 1996, Africa Online has seen its market share in Kenya alone increase from zero to more than 85 percent of Kenyan businesses with Internet access.

Although most Americans' perception of Africa might still come from bad Tarzan movies or Sally Struthers commercials asking for donations to help starving children, Africa remains a vibrant, growing community that no one else but Prodigy seems interested in tapping. ◆

EDUCATION LINK

by Rea Andrew Redd

DOIN' THE NUMBERS: TEACHING WHAT YOU'VE BEEN TAUGHT

Rea Andrew Redd lives and works in southwestern Pennsylvania where he manages a high school library, teaches European history and Scholastic Achievement Test preparation. On occasion, he reenacts American Civil War battles with the Ninth Pennsylvania Reserves, an historic, military impression unit. E-mail Rea at: redd@genesis.duq.edu

Jostens Learning Corporation and the American Association of School Administrators surveyed 1,001 teachers and school superintendents and found that the Internet was low on their wish lists. As reported by *USA Today*, getting more computers into classrooms and networking classrooms were high on the wish list of the educators. While 94 percent of those surveyed feel that computer technology improves teaching and learning, the Internet in the classroom did not come out as the top use among teachers. Record keeping and basic computer skills were the most frequent uses of electronic wares.

Research on the Internet accounts for about 30 percent of all student work done on a computer in the classroom. Even though there are computers in 90 percent of U.S. schools and about two-thirds have some Internet access, Internet education is not a top priority for those surveyed.

Of the 1,001 surveys, the highest priority for 35 percent is connecting the classroom computers to the building's and district's computer systems. The top priority for 29 percent is Internet access. About 50 percent of these educators have some classes in computer labs and about 35 percent use computers in their classrooms. Nearly 50 percent of those surveyed wish educators were better trained in computer technology and its classroom application. In a related article, *USA Today* reported that U. S. Department of Labor Statistics figures show that 220,000 more elementary teachers and nearly 200,000 more special education teachers will by needed by the year 2005. Also, 390,000 more secondary teachers will be needed. While net job growth will be up about 15 percent by 2005, in education the job growth will be 22 percent. What will the high school class of the year 2000, which graduates from college in 2004 and fills education jobs after graduation, know about computer education?

I wish that the survey would have included questions like, "Did your undergraduate (post -graduate) training prepare you for using computers in the classroom?" and, "What training method has left you with the most practical lessons and the most positive feelings?" It is a well-founded generalization that teachers teach like they have been taught. If the Internet and education are a good fit, then somehow the generation which is school right now are going to have to be taught well and convinced that they should be teachers. Yes, the computer is nice for record keeping and it is nice to keep an electronic grade book and to download grades to the district's computer center where the technician prints out the report card. But, teachers are going to have to be rounded up and herded back into the classroom and taught by master teachers on how to use computers and the Internet in classrooms.

Of course that won't happen. One of the genuine goals of education, from the ancient Greeks through present times, is to produce graduates who can teach themselves. From Aristotle to Madeline Hunter, from question asking to cooperative learning, the goal has always been: learn how to learn, then learn how to teach. Sometimes I think that teacher education in the U. S. has skipped the first part. In the U.S., our system teaches degree candidates to be educators before they know how they themselves learn. Which makes a book like *Net Lessons: Web-Based Projects for Your Classroom* essential for the educator who has learned to teach themselves as well as others. Laura Parker Roerden and O'Reilly Publishing are fast approaching the stunning accomplishments of Classroom Connect, when it comes to presenting quality and achievable lesson plans for the K-12 classroom.

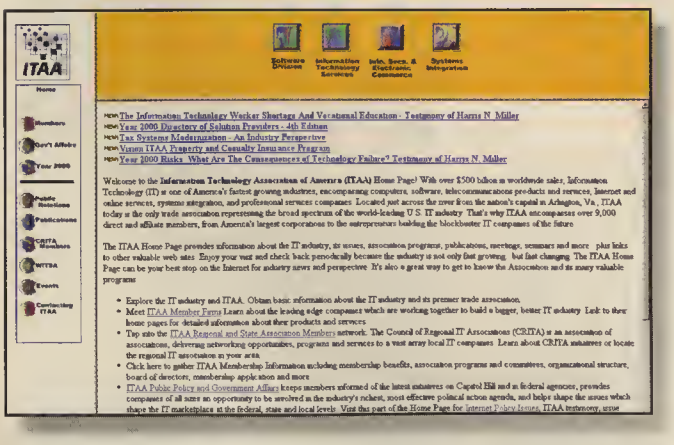
Tested in classrooms, the 100 lesson plans in *Net Lessons* includes extension activities that take a one or two day lesson and expands it into an entire unit which can be integrated into any traditional curriculum. Curriculum frameworks for generating new lesson plans and web projects, assessment tools, and classroom management tips make *Net Lessons* a very practical tool for the self learner. The book includes multiple cross-referenced lists of topics which can be located by subject, age group, and activity type. Whether you are looking for a cooperative activity, a research activity, or a gifted activity, it's in here. In the Appendix A index, you will find 13 lesson plans

under Conflict Resolution, and 25 under Mathematics. In the same index you have 40 elementary level lesson plans. Appendix B has related worksheets and Appendix C lists top sites by subject area. And the book still has a general index which locates info by subject, such as the American Civil War (a personal favorite). *Net Lessons: Web-Based Projects for Your Classroom*, Laura Parker Roerden, Sebastpol, CA: O'Reilly & Associates, Inc., 1997, **$24.95.** 285 pages, paperbound, CD included. (`info@ora.com` or `www.ora.com`)

SPUTNIK REVISTED

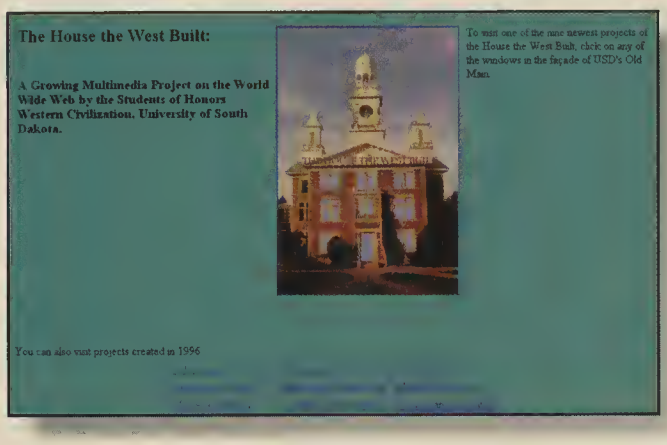
Didn't Michael Crichton write a book about this? The Picture: The U. S. is falling behind the world in information technology because it isn't producing the talent to fill the need for artisans who can expertly use digital chisels and hammers. The Information Technology Association of America (ITAA) reports that one of every ten jobs requiring info-tech skills is going unfilled because there is a vast shortage of adept workers. A survey of over 2,000 large and medium-sized U. S. companies revealed nearly 200,000 job vacancies. The info-tech worker shortage is due to the dwindling number of graduates with math and computer science degrees. Since 1986, the number of students earning computer science degrees has fallen over 40 percent and those earning mathematics degrees has fallen almost ten percent. If the shortage of skilled workers continues, wages in the field will rise to a point at which American companies may spend more of their product development overseas, where there are enough workers. ITAA thinks that the quickest and surest way to make up the shortfall is to focus on community colleges and info-tech vocational training. The association hopes that private sector business will develop partnerships with regional community colleges to quickly bring about an innovation in curriculum. To get a copy of the survey and the accompanying report, go to `www.itaa.org` and look for "Help Wanted: The IT Workforce Gap at the Dawn of a New Century." A print copy is available , at no charge, from **I. A. A., Suite 1300, 1616 North Fort Myer Drive, Arlington, VA 22209**; voice call **703-284-5342.**

WHAT'S WORKED?



Let's look around to see some success stories. English departments are starting to teach writing on the Web and even a few are teaching writing *for* the Web. Some writing techniques are transferable from paper to screen and some are not. The Internet as a medium of expression requires a structuring and display of material not necessarily the same as print medium. George L. Dillion, professor of English at the University of Washington, teaches English 481—Writing for the Web. The goal of this course is for students to author their own web pages. Students use the basics of marking up a page with HTML, creating hyperlinks, and inserting images or sound. To view samples of their work and catch the drift of Dillion's teaching style go to `weber.u.washington.edu/~dillon` and see what has worked.

Remember Western Civ, History 101-102? Probably your freshman year in college? Well, it's a little different today, especially at the University of South Dakota. Clayton M. Lehmann, professor of history, had his students develop a multimedia presentation entitled *The House the West Built*. In cooperative groups of five, students select and research a small portion of Western Civilization and publish their projects are on the Web. Text, graphics, audio, video, using HTML, presents historical information. To see what has worked with college freshman and sophomores, go `www.usd.edu/honors/hwb.html`.



With the smell of formaldehyde, you can dissect on the Web. John Beneski and Jack Waber, biology faculty of the University of Pennsylvania at West Chester, have developed the Virtual Biology Lab. An alternative to the traditional laboratory in a college level, introduction to biology course, Virtual Biology Lab is an interactive CD-ROM application which presents concepts from cell chemistry to ecological systems. Using Bodyworks 4.0 for the human dissection should improve the effectiveness and efficiency of a large lab setting. Microscopes, radioisotope counting, electrophoresis, and chromatography is done by performing experiments, generating data, analysis and explanation of biology concepts. To catch the latest progress of Virtual Biology Lab as it is being tested, go to `www.wcupa.edu` and see how it works.

"Here comes the judge! Don't look now, but here comes the judge!" From Rowan and Martin's *Laugh-In* to Top Forty Radio, everyone for a year or two in the 1960s was walking around saying it. Well, the judge is on the Web. "Oyez, Oyez, Oyez: A Supreme Court Web Resource" is a site for the civics, political science, or law classroom should visit. It's the U. S. Supreme Court judges which are coming to us digitally. While it is under construction, you can still visit this digital courthouse. When it is finished, 750 hours of audio will give students the opportunity to hear unedited transcripts of oral arguments before the U. S. Supreme Court. Biographies, photographs, almost 1,000 links, texts, and a plethora of additional audio and video segments are being added this year. Jerry Goldman, project director and Northwestern University political science professor, is the digital puppeteer; go to

oyez.at.nwu.edu/oyez.html and see it under construction. For classroom applications, send e-mail to j-goldman@nwu.edu.

THIS WEB'S ON FIRE

Along with most of my family, I like to reenact the American Civil War and I have a son who reenacts the Age of Chivalry, but we do have our limits. The Chicago Historical Society and Northwestern University's Academic Technologies Department are celebrating a maelstrom which I will only observe digitally, thank you. October 8th, 9th ,and 10th is the anniversary of the Great Chicago Fire of 1871 and "The Great Chicago Fire and the Web of Memory" (www.chicagohs.org/fire) is an online exhibition to commemorate the tragedy. Carl Smith, an English and American Studies professor at Northwestern and the primary author of the site, wrote the content for the 350+ page site. Drawing upon his own recent print published work, *Urban Disorder and the Shape of Belief: The Great Fire, The Haymarket Bomb, and the Model Town of Pullman*, Smith contributed 12 essays and nearly 300 brief commentaries. Photographs, lithographic prints, letters, broadside advertising, paintings, journalism, and artifacts cram the this site. About 175 pages are used to reconstruct the story of the fire itself with maps, drawings and first person accounts. Amazing features of this segment are the 360 degree panorama photograph of Chicago before the fire, several audio songs written after the fire, and even one minute newsreel.

THE K-12 BROWSER

This Month's Top Ten List

Scantron Inc., purveyors of quality education hardware and software, offers their best of the best list and links to them from their web site www.sqc.com/ntcn/focus.html. Their criteria for selecting a site is that it has to be nearly perfect for both student and teacher to explore. And the winners are:

1.) www.school.discovery.com
The Discovery Channel School, lesson plans indexed by topic or grade level

2.) forum.swarthmore.edu/dr.math
Ask Dr. Math, personal math questions get personal answers

3.) www.testprep.com
TestPrep.com, Stanford Testing Systems, sample tests and online courses for SAT *et al.*

4.) www.kidshealth/org
Kids Health, Nemours Foundation, latest medical info from acne to zymotic disease

5.) www.wentworth.com
Wentworth Inc., a one stop shop for kids and teachers

6.) www.utexas.edu/world/lecture
World Lecture Hall, University of Texas, downloadable lectures and aids on everything

7.) www.nationalgeographic.com
National Geographic Association, famous nature photography and expeditions

8.) www.ancestry.com
Ancestry Search, easy guide to basic family tree construction

9.) www.exploratorium.com
The Exploratorium, the museum as teaching lab, dissect a cow's eyeball or visit Nagasaki

10.) www.osc.on.ca
Ontario Science Center, interactive science experiments and teacher resources

I Like Books

California State University at San Marcos' Center for the Study of Books in Spanish for Children and Adolescents provides access to information on over 2,000 books. Records in the database include bibliographic information, grade level, subject, and a brief abstract of individual titles. Go to www.csusm.edu/campus_centers/csb for recommended books for Spanish readers. A full complement of books available online can be found at the national supercomputing center of Carnegie-Mellon University; go to www.cs.cmu.edu/Web/books.html and browse to your heart is content. Enthusiastic readers of any age can write book reviews for the world's largest online bookstore found at amazon.com. You will find some of my reviews there.

THE COLLEGIATE BROWSER

Education

Seneca College of Applied Arts and Technology and the Association of Colleges of Applied Arts and Technology in Ontario jointly offer *The College Quarterly*, on online version of the print edition, which focuses upon higher education and faculty classroom issues. At www.collegequarterly.org, articles, reviews, Internet links, products and services for college educators are located. A moderated discussion of the history of universities, "**studium**," along with announcements for conferences, published articles, reviews and employment opportunities. This discussion group is located in listserv@ccl.kuleuven.ac.be. A related discussion group works on issues concerning education and research — "**newedu-l**" located in listserve@uhccvm.uhcc.hawaii.edu—delves into new educational technology, especially delivery systems, collaborative and distance learning. If you are an electronic conversationalist and an educator, then "**aacis-l**" may be for you. A moderated discussion sponsored by the American Association for Collegiate Independent Study and focuses upon correspondence courses and distance education. Go to listserv@bgu.edu. A home page for **ACTV, Inc.** offers information on eSchool Online, which is a distance learning program using multimedia technology and the Internet. Go to www.actv.com for a private sector, for-profit approach to distance learning.

Medicine and Health

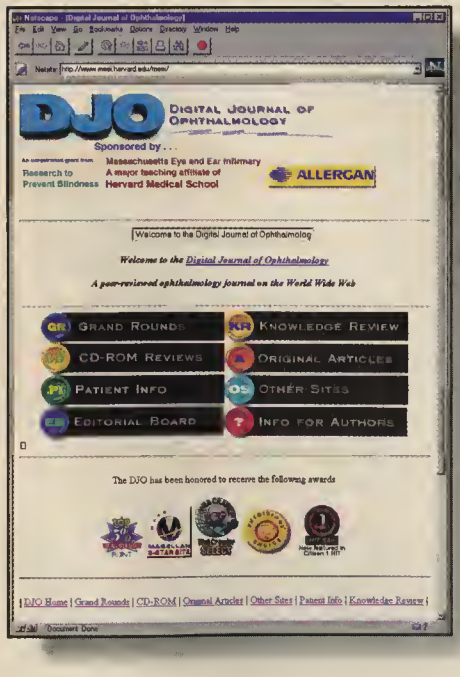
For some relief from your aches and pains you should : 1.) drink orange juice and go to bed; 2.) take two aspirin and exercise; 3.) check out The Center for the Advanced Study of Public Safety and Injury Prevention. The State University of New York, sponsors the Injury Prevention Library at www.albany.edu/sph/injr_013.html and invites faculty, researchers, students and practitioners to per-use monographs and data sets related to injuries. If diet is an issue with you, then visit the University of Illinois at Urbane-Champaign. It provides access to a program that analyzes more than 2,500 food items with an eye upon the U. S. Department of Agriculture's daily-allowance standards and data—spectre.ag.uiuc.edu/~food-lab/nat is a site that helps users to evaluate and change the food they eat.

When you just have to talk about paying for your aches and pains, you should go to a forum entitled *healthpol*, which dis-

cusses the U. S. health care system. This dialog is for those who are working in the field of health care policy and is located at `listserv@home.ease.lsoft.com`. If reading is your best learning style, then *The Digital Journal of Ophthalmology* can be accessed through Harvard University's Medical School web page. This peer-reviewed scholarly publication which contains case studies, original articles, software reviews, and links to other Internet resources is located at `www.meei.harvard.edu/meei`. Case Western Reserve University maintains `mediswww.meds.cwru.edu/internet/medresources.html` for researchers and students who are looking for an up-to-date electronic bibliography. This listing of Internet resources is comprehensive and includes FTP and gopher sites, as well as home pages, on medical practices, infectious diseases, both popular magazines and scholarly journals, and databases. At Yale University, the Center for Medical Informatics provides "**GASNnet**," the Global Anesthesiology Server Network. The site contains a Digital Echocardiography Reference Library, related journals, reviews of software, videos, and books, a listing of abstracts, a discussion group and a newsletter. Go to `gasnet.med.yale.edu`.

History

Whenever I get on the Internet looking for new materials on the American Civil War, my first stop is Louisiana State



University which offers a site more than 1,000 links to other electronic resources, including diaries and letters which have never been in print before, military unit histories, and both college and high school research projects. Recently, I found a great set of course papers which delved into wartime Richmond from a social point of view. This and more can be found at `www.cwc.lsu.edu` which is the home page of the U.S. Civil War Center —an organizing body of the 150th anniversary of the American Civil War beginning in the year 2010. The University of Virginia offers access to an online database of narratives of former slaves from across the South, and interviews by journalists and writers directed by Roosevelt's Public Works Administration during the 1930s. The location for this great primary source documents is `xroads.virinia.edu/~HYPER/wpa/wpahome.html`.

The Library of Congress presents "American Life Histories: Manuscripts from the Federal Writers Project, 1936-1940," This web site (`rs6.loc.gov/wpaintro/wpahome.html`) makes available a small portion of the vast collection of the Works Progress Administration's historical records survey. It also includes interviews, bibliographic information, and photographs culled from among the thousands held by the Library of Congress. For economic history, the Edison National Historic Site (ENHS) offers access to *Business History Resources*, first in a series of essays by business and economic historians. The archives of the ENHS (`www.eh.net/~bhc/Exchange/edhome.html`) includes essays, electronic links, and many images from the ENHS's photographic collection. Archives and museum administrators have a home page at `archimuse.com` where conference, seminar, and workshop announcements are made along with postings on news relating to preservation and curating of cultural and heritage resources.

Duke University's Special Collections Library has a wonderful site entitled *Digital Scriptorium*. The electronic archive is vast here and runs the gamut of a pamphlet collection focusing on early European history to the memoirs and letters of 19th century African-American women. Visit this virtual center located at `scriptorium.lib.duke.edu` for a wide range of primary source documents for your classroom. More primary source documents are present by the University of Kansas History Department's web page (`www.kuhttp.cc.ukans.edu/history/index.html`) at which Africa, ancient Europe, world, and women's history is offered.

When historians aren't writing they're talking. An academic discussion group for social history, "publist," is found at `listserv@listserv.iupui.edu` and a discussion group for international historians who study American culture and history, "h-usa," is located at `listserv@h-net.msu.edu`.

Information and Library Science

For discussion of laws and regulations affecting broadcast, cable, and telephone systems go to "**com-law-l**" located in `listserv@lawlib.wuacc.edu`. If you need help with your Lotus Domino software, then check out the unmoderated forum, "**domino-l**" in `listserv@listserv.nipltd.com`. The Greater Orlando Novell Users Group invites you to share in the discussion going on at "**gonugs**" located in `majordomo@ecosoft.com`. Windows 97 software users are helping each other out at "**win97**" located in `listserv@maelstrom.stjohns.edu`. Windows 95 users will find conversion and installation tips there also.

A discussion for educators who use satellite technology to exchange information and news related to setting up and receiving broadcast or satellite signals is "**satedu-l**." It is located at `listserv@wcupa.edu`. If you are involved in web site or server design, construction, maintenance, administration and programming, then poke your nose into "**web-master-l**" located at `majordomo@cybercorp.net`. When your chosen field is Africa and electronic technology, drop in on the African Studies Association's "**etg-list**" located at `listserv@listserv.syr.edu`. The intellectual and technical aspects of indexing books, databases, periodicals and online texts is the focus of "**index-l**" located at `listserv@bingvmb.cc.binghamton.edu`. The West Virginia Library Commission offers a comprehensive directory of online resources related to the state. The site has links to the home pages of academic, public, and special libraries located in West Virginia. Archaeological sites, geography, history, culture and economic information samples of the libraries photography archives are also in the database; go to `www.wvlc.wvnet.edu` for an electronic trip down a country road. ◆

PUTTING THE NET TO WORK

by Durant Imboden

PACKAGING VS. CONTENT

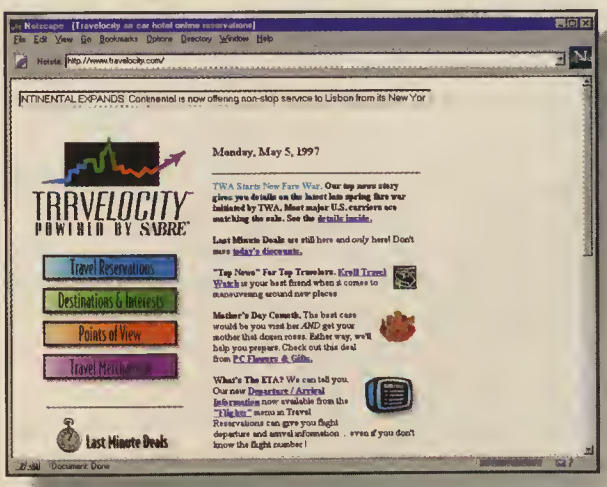
It wasn't so long ago that getting information on the Net meant digging through directories with a Gopher or downloading a text file from an FTP site. Then the Web came along, and the document interface shoved its predecessors into the shadows.

Today, hypertext documents are being gussied up with animated GIFs, video clips, RealAudio, Java applets, and other multimedia goodies. Commercial "Webcasters" deliver content on television-style "channels," and online services like the Microsoft Network have "producers" who package "shows." Editors of computer magazines predict that today's two-dimensional web pages will be replaced by 3D virtual environments that users "walk through" instead of merely viewing on their computer screens. Multimedia firms pay top dollar for Java, ActiveX, and database developers while hiring writers and editors through temp agencies as if they were secretaries. The implication is clear: On today's Internet, packaging and programming are the features that really matter.

In this column, I'll dissect major commercial Web sites to illustrate the challenges in finding a good balance between form and content. (NOTE: All my examples are travel-related, since I'm a travel buff and would rather research travel pages than sites devoted to Mid-East peace talks, Scientology, or SQL databases.)

TRAVELOCITY

Travelocity is a web megasite sponsored by SABRE, the reservations arm of American Airlines. Its mission is to sell airline tickets, cruises, hotel bookings, and car rentals.



Although Travelocity is a transaction-driven site, it offers a veritable encyclopedia of travel information as a way to bring users into the store. That's good. What isn't good is the quantity or quality of the information and how it's served up.

Let's say you're planning a trip to Zurich, Switzerland. You open your web browser to `www.travelocity.com` and scan the rather busy home page. You click the button labeled "Destinations & Interests," which takes you to an equally busy page with a clickable image map of the world, a search engine for weather reports (U.S. only, curiously enough), and a text column along the left side of the page that doesn't display properly at certain resolutions. You click "Europe" and are taken to another page with a list of countries. Click "Switzerland," and you finally get to select your destination: "Zurich & Environs."

Now that you're on the Zurich page, you see a list of topics: "Arts & Cultural Exhibits," "Music Performances," "Restaurants," and 14 other headings. You're curious about excursions from Zurich, so you select "Local Tours & Trips" and pick "Lucerne" from the page that displays on your screen. After you've drilled down nine levels at 28.8 Kbps, here's what you get on Switzerland's premiere tourist city:

> *Lucerne (Luzern)*
> *The focal point of Zentralschweiz (Central Switzerland), Lucerne is known for its arts festivals and shopping rather than its local industry. The 700-year-old Franziskanerkirche (Franciscan Church) retains its 17th-century choir stalls and carved pulpit, while the 8th-century Hofkirche proudly displays an 80-rank organ, Switzerland's finest. A highlight is the Kapellbruecke (Chapel Bridge), snaking diagonally across the river with its shingled roof and grand water tower; this dark, creaky landmark is adorned by 112 17th-century gable panels depicting the histories of Lucerne and Switzerland. About 30 miles (48km) southwest of Zurich.*
> *Tel. 41/1/211 40 00*
> *Fax. 41/1/212 20 14*

And that's it-a paragraph that could have been lifted from the World Almanac. To make matters worse, all of Travelocity's tourist information is displayed this way: as individual pages with text that would fit easily on a 3" x 5" index card. If you wanted to save the restaurant list for use in Zurich, you'd need to print more than two dozen 8-1/2" x 11" sheets. And if you felt tempted to bring all of Travelocity's Zurich information along on your trip, you might end up with half a ream of paper in your carry-on bag.

Durant Imboden is a freelance writer whose credentials include published novels and nonfiction, fiction editing and staff writing for ***Playboy***, travel writing for corporate clients, and representing authors at a New York literary agency. He currently manages the Writing Forum on The Microsoft Network and co-authors the "Flame Wars" column on Delphi, where he is an editorial consultant. Durant maintains a web site for writers at **http://www.writing.org**. **MailTo:** `imboden@writing.org`

The destination pages on Travelocity appear to have been designed for one purpose: to maximize advertising opportunities by placing each tidbit of information on a separate page with its own banner ad. As a result, the site is dysfunctional and annoying. And because Travelocity doesn't offer links to more comprehensive destination sites, prospective travelers go away with only a little more knowledge than they had when they arrived.

Editorial rating: C-

MICROSOFT EXPEDIA

Travelocity's packaging emphasizes structure and logical organization rather than beauty. Expedia takes a different approach: "Build an attractive interface, and they'll come."

Expedia, at `expedia.msn.com`, is another transaction-driven site. Like Travelocity, it uses content as a way to build traffic for its "Travel Agent," "Fare Tracker," "Hotel Directory," and other retail modules — which, by the way, are much prettier than Travelocity's, with Wizards that make it easy to look up a fare, check a flight schedule, or reserve a specific seat with the help of a "Seat Pinpointer" diagram.

Expedia's editorial content consists of "Full Circle," a series of 360-degree travel photos in Microsoft Surround Video; "Expedia Magazine" and "EXperts," a collection of features and columns; and "Expedia World Guide," an online guidebook to some 300 travel destinations.

"Full Circle" is nicely done. As each photo displays, you can let it pan slowly on its own or control the rotation with your mouse. New scenes are posted twice a month, and old panoramas are stored in an online archive.

"Expedia Magazine" and "EXperts" are less impressive. Some of its content is recycled—this month's lead story on Paris is based on an existing "Full Circle" feature—and many of the other articles could have been lifted from Reuters.

"Expedia World Guide" is most disappointing. It reportedly contains 14,000 pages of information, but its contents are spread thinner than the paté on a two-franc sandwich.

"Switzerland," for example, contains only two cities: Geneva and Zurich. To make matters worse, the descriptions seem to have been borrowed from a Chamber of Commerce brochure or a student's geography report. The opening paragraph of the Zurich "Overview" page includes the sentence:

> *"The largest city in the country, with a population of about 350,000, Zürich is an important commercial and manufacturing center and is the financial capital of Switzerland. Major products include printed materials, electrical and electronic equipment, processed food, machinery, textiles, and clothing."*

Drill down, and things don't get any better. The "Historical and Architectural Sites" page contains exactly two short descriptions. "Museums and Exhibits" has just three items, and "Attraction Highlights" links to three of the entries I've already mentioned.

"Nightlife" has one-sentence descriptions of a gay bar, a nightclub, the opera house, and a chamber orchestra, with addresses and phone numbers. "Tours & Excursions" mentions a boat tour, a waterfront stroll, and a nearby town. Each bite-size description occupies a frame of its own—presumably to give an illusion of depth and breadth, since there are no banner ads on the pages.

Unlike Travelocity's Destinations & Interests area, Expedia's World Guide obviously had a large production budget. Yet nearly all of that money was spent on graphic design, to judge from the paucity of content. Expedia also shares Travelocity's aversion to external Web links. The site has token links to the outside world, but they're few and hard to find. Expedia also shows a rare degree of *chutzpah* by soliciting links on other Web sites with a full page of buttons and logo usage guidelines while offering nothing in return.

Net result: Expedia's World Guide is like a Burger King Whopper built around a White Castle patty. It looks filling, but in the end there's less than meets the eye.

Editorial rating: C+

EXCITE CITY.NET

City.Net was one of the earliest destination guides on the Web. Today, it's known as the *Excite Travel Channel*, although the `www.city.net` URL still works and the City.Net logo continues to adorn each page.

Unlike Travelocity and Expedia, City.Net shows its search-engine roots by including plenty of links to third-party web sites. It also has fact sheets and mini-guides on major tourist and business destinations.

A typical fact sheet lists passport and visa requirements, the local language, currency, health advisories, voltage requirements, business hours, dress, tipping customs, weather, and other practical information. The accompanying "where to eat" guide might include a dozen restaurants skewed toward the expense-account traveler, while the hotel guide would list a sampling of business and first-class hotels. Other pages give useful advice on transportation, sightseeing, and shops. Each topic's listings are kept together on a single page for easy navigation and convenience in printing.

Web links are organized into categories such as "history and literature," "city guides," "events," and "lodging." This rigid structure sometimes leads to duplication or leaves the reader uncertain about where to look. (For example, my own Baby Boomer's Venice site at `www.writing.org/venice.htm` is

listed under "City Guides" but not under "Travel & Tourism.") The selection of links isn't as comprehensive as it should be, and there are no site descriptions.

Despite these quibbles, Excite's City.Net is far superior to Travelocity or Expedia as a source of travel information on cities and countries. It also offers airline, hotel, and car-rental booking services-a fact that makes its links to Expedia and other competitive sites all the more remarkable. Are these guys paragons of Christian charity, or are they just devoted to the Net Ethic?

Editorial rating: B+

THE ROUGH GUIDE

HotWired distributes the online versions of *The Rough Guides* at `www.hotwired.com/rough`. The city and country pages are useful but lacking in depth. They seem to exist mainly as teasers for the publisher's guidebooks.

The term "paragraph break" doesn't seem to be in the editors' vocabulary, to judge by the way information is crammed into the descriptions and listings. Third-party links are ignored. Still, *The Rough Guide* web site delivers facts and recommendations in a format that can be viewed quickly and printed easily. For what it is, it isn't bad.

Editorial rating: B-

FODOR'S

Another guidebook publisher, Fodor's, has taken a more ambitious approach to publishing on the Web. The company's site at `www.fodors.com` has a "Personal Trip Planner" that lets the reader assemble a "`miniguide`" with hotel recommendations, restaurant reviews, and useful travel information such as how to reach the city from the airport. This miniguide is displayed on one long roller towel of a page that can be printed out as a trip takealong.

The reviews are detailed, with highly readable descriptions from the company's guidebooks. (One complaint: The hotels are grouped by price category, but specific rates aren't quoted.) Fodor's also has better sightseeing descriptions than its competitors, and the overall standard of writing is extremely high. There are a few gaps, however. In the Zurich miniguide, the "how to reach Zurich by train" section lists just one train, the Venice-Simplon-Orient-Express (a cruise-style luxury train for tourists). This oversight seems a little odd for a city that lies at the heart of Europe's rail network.

Other editorial content on the Fodor's site includes articles on featured destinations and a "know before you go" area with an audio phrase book, a currency converter, travel tips, and similar material. All in all, the Fodor's site is a great example of combining sophisticated packaging and programming (such as the personalized trip planner) with high-quality editorial content.

Editorial rating: A-

THE MINING COMPANY

Scott Kurnit's new web operation at `www.miningco.com` takes a different approach to travel from the sites I've discussed earlier in this column. The Mining Company is a "metasite" that combines the best features of a hierarchical index (a la Yahoo), an online service, and individual web sites. Its travel area, for example, consists of separate, highly focused sites produced by independent contractors or "guides" who work for a share of advertising revenues. By using active server pages and simple templates that act as "containers" for the guides' editorial content, The Mining Company maintains design consistency without having to build web pages in-house.

(FULL-DISCLOSURE STATEMENT: I'm producing a Venice for Visitors site at `govenice.miningco.com`, and my wife has applied to be the Switzerland for Visitors guide as I write this.)

The Mining Company doesn't pretend to be a self-contained travel resource. Instead, its guides offer masses of well-organized, hand-picked "deep links" and "optimal links" to Internet resources within each topic area. This saves the user from having to dig through 577,092 Excite hits on "London" or 71,624 HotBot listings for "Zurich."

Guides are also expected to write an editorial feature each week-typically a short article on a topic of interest to a site's visitors. Old columns are archived for quick retrieval from a "previous features" page.

Open Kyle Phillips's Tuscany for Visitors at `gotuscany.miningco.com`, and you'll find half a dozen featured web links plus a column on "the mysteries of Italian pizza menus." Previous features include such topics as "a day at the races" (Italian car racing), San Galgano (a saint's abbey), and the Good Friday festival in Grassina, a town outside of Florence. Click on "Best of the Net" or "Resource List," and you'll find links to sites that range from Firenze.Net (an English-language site on Florence) to the Italian railway timetables and the Italy Online Reservation hotel network.

Click on New Orleans for Visitors, go `neworleans.miningco.com`, and Pixie Messina will introduce you to that city's architecture through an article with photos of Creole Cottage, Spanish Colonial, and other local housing styles. You'll also find links to a virtual tour of a Louisiana plantation and other web sites that you might not find on your own.

The Mining Company is new, and only nine travel sites were live at this writing, so it's difficult to say how the company's offerings will stack up next to the corporate megasites. It's reasonable to assume that quality will vary from adequate to excellent, but the basic concept scores of annotated links, plus a growing archive of editorial features-is likely to make The Mining Company an essential stop on any tour of web travel sites.

Editorial rating: Too early to tell

THE BOTTOM LINE

From a user's point of view, packaging and programming aren't good substitutes for editorial content. At the same time, there's no rule that says valuable information can't be delivered on an attractive page with great interactive features.

Expedia is a good example of a site that looks good but comes up empty (except for its state-of-the-art reservations tools, which don't fall under the "editorial content" umbrella).

The Mining Company, Excite's City.Net, and *Rough Guide* deliver useful information with the "content is king" approach.

Travelocity shows the dangers of letting greedy sales managers dictate page design.

And Fodor's demonstrates the appeal of useful information in a handsome, fun, user-friendly interface. ◆

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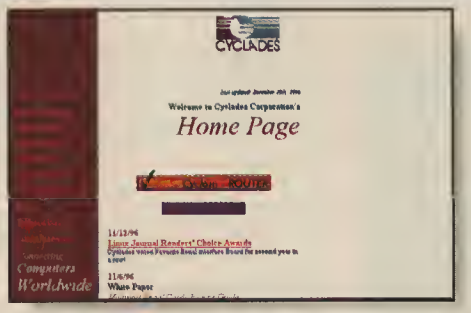
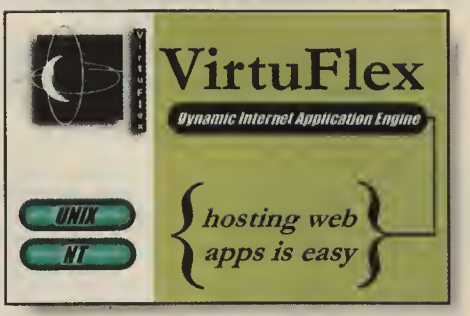


http://www.cyclades.com

Cyclades Corporation: Designs, manufactures and markets connectivity products: Multiport serial cards, routers, communication adapters and re-mote access servers. Cyclades supports UNIX and Linux, Window NT/Win95, BSD-derived markets, SCO, DOS, and Fossil for most of our products.



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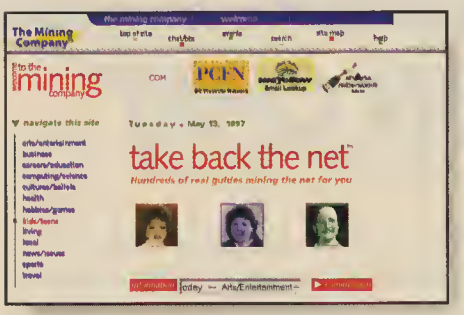

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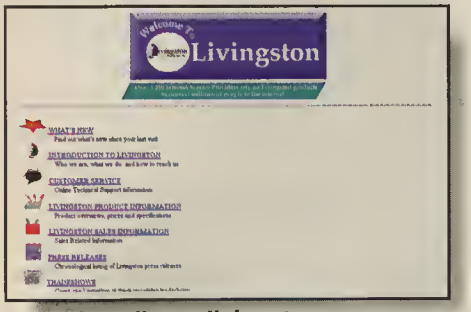

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Livingston: Over 1,500 Internet Service Providers rely on Livingston products to connect millions of people to the Internet.

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DiscPress: ISPs, distribute Netscape or MSIE on CD-ROM for only $0.75 per disc. Services tailored to the unique needs of ISPs. **888-311-disc (3472)** or **203-759-0574**

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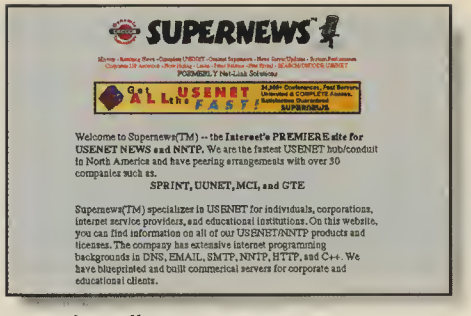

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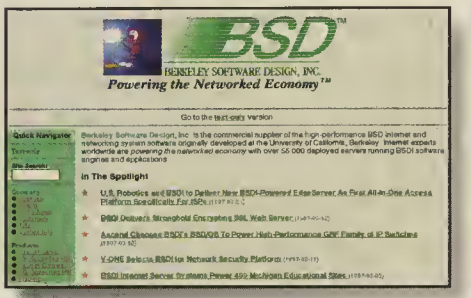
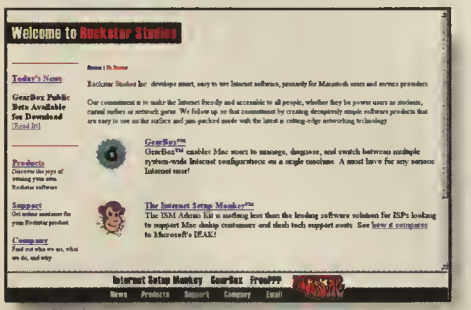


http://www.bsdi.com

Berkeley Software Design: The most complete Internet server software includes Netscape FastTrack Web server, Apache Web server, News Server, mail server, FTP Server and more. Over 2,500 ISPs worldwide and Fortune 500 companies rely on BSDI for top web and Internet/Intranet power and stability. No additional OS to buy. Installs in minutes and features GUI configuration manager.

http://www.agis.net

AGIS: Get AGIS and get connected! AGIS is a leading Internet backbone services provider specializing in dedicated high bandwidth connectivity to the Internet backbone for Internet service providers, content providers, and large corporations. Visit our web page for details on how your company can get connected to the AGIS high speed backbone!



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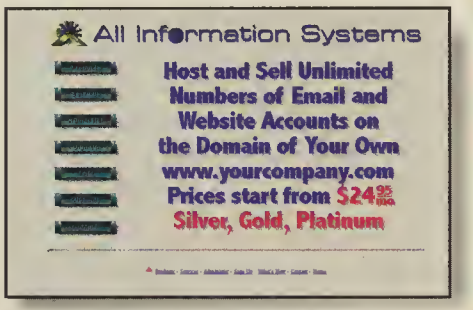

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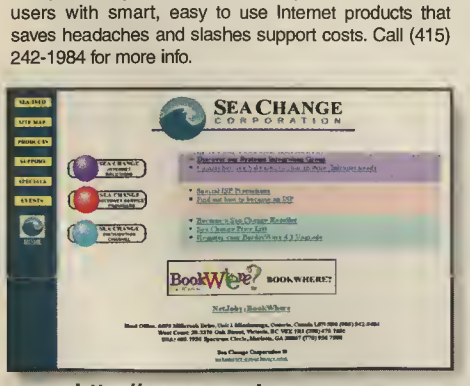

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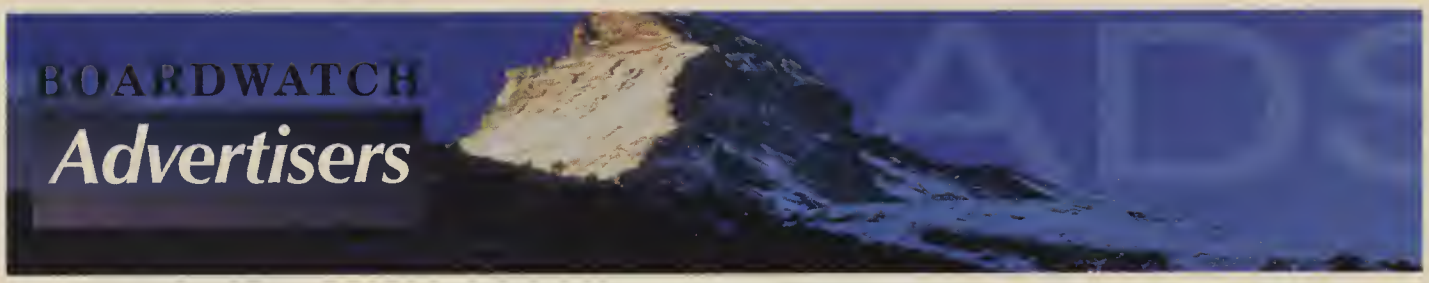
http://www.shiva.com/isp/bwatch.html

Shiva Corporation, Bedford, MA. Winner of the 1996 Data Communications Tester's Choice Award, Shiva's LanRover Access Switch brings proven Shiva remote access technology to Internet Service Providers. With over 200 MIPS of multiprocessing power, the LanRover Access Switch has a switching architecture designed to support over 100 concurrent users.



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DIRECTORY OF INTERNET SERVICE PROVIDERS

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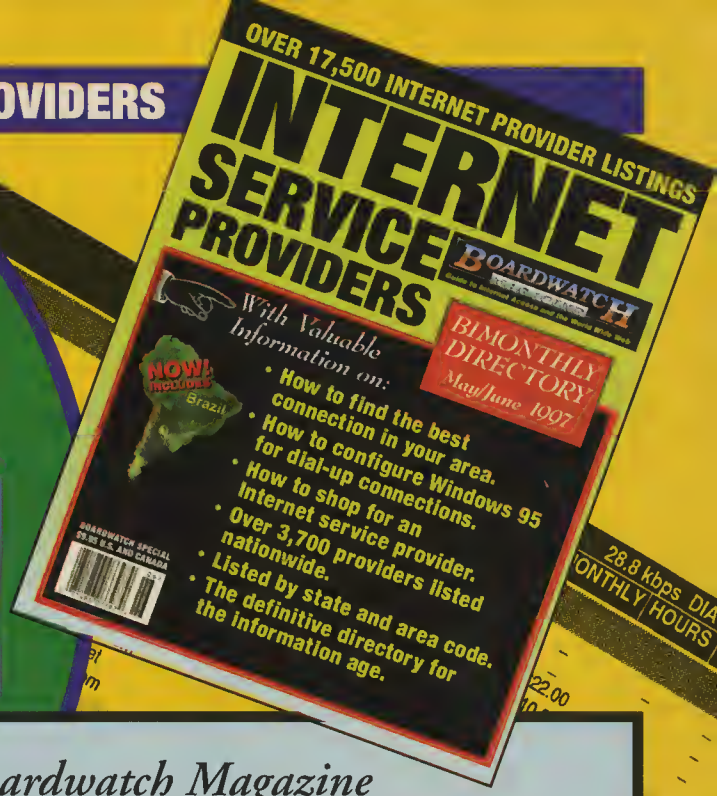

In addition to the provider directory the *Boardwatch Magazine Directory of Internet Service Providers* also contains valuable information on:

Detailed instructions on how to get connected to the Internet

Why get on the Internet

How to configure hardware to get on the Internet and how to use it once you're there

The history of the Internet, its current trends and where it's going in the future

How many people are really on the Internet and who they are

and much more!

The *Boardwatch Magazine Directory of Internet Service Providers* is for anyone who wants to get connected to the Internet now or stay connected to it for the least cost.

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BOARDWATCH MAGAZINE

Guide to Internet Access and the World Wide Web

DVORAK ONLINE by John C. Dvorak

THE FUTURE HAPPENED WHILE YOU WERE ASLEEP

"Very shortly TVs are going to have more processing power than the microprocessor did when it first came out," declares Dr. Ernest Kent, director of the Information Sciences Research Sector at Philips Laboratories in Briarcliff Manor, N.Y. "This year's or next year's sets would be able to run BASIC if you put it in there."

Matsushita is already testing a voice recognition interface that would allow you to change the channel on a TV, or program a VCR, by speaking into a wireless microphone. Owners could operate a television with "not many words," Mizuno says, because commands like "up" could be paired with "channel" or "volume." as for a VCR, Mizuno expects you'd merely have to announce the channel, day, and time, and say "make record" to have the machine do your bidding.

—taken from an article in *Popular Science,* November, 1990

I was cleaning up my hard disk when I ran across that *Popular Science* article I got from some download seven years ago. These rosy predictions of cool, new equipment makes you wonder how much nonsense is being sold as a "sure thing" even today. So I dug around the hard disk and found a lot of cool quotes. Now I see why going online all the time has a certain appeal to someone like me. I get to use old downloads for columns.

The following is from a report done at the 1991 Comdex Show and a CD-ROM panel:

Trends in CD-ROM Technology

Nintendo will lead the charge of the CD-ROM. That's the conclusion from a panel of experts who gathered at a recent trade show to discuss the future of CD-ROM....First of all, everyone agreed (some reluctantly) that CD-ROM's popularity will increase dramatically when Nintendo rolls out a CD-ROM based game machine which is expected to ship within the next year. The audience criticized the manufacturers of CD-ROM systems for the PC saying that there is no reason that Nintendo should suddenly become the market leader after all these years. It was pointed out to the panel that the price of CD-ROM drives hasn't fallen fast enough and there was a hint that the prices were fixed.

— *PC/Computing,* September, 1991

Interestingly enough after all that time, Nintendo is the company selling game machines and software that *did not* use CD-ROM technology. The key to its popularization turned out to be bloated code! By the way, I wrote those words for *PC/Computing*. Luckily, I wasn't the one who made the prediction. In this case I was merely reporting. (Whew!)

So let's dig even further and try to guess who made the following comments:

"Do you know who can access a computer to find out how much is in your checking account? How many times you've been divorced? Whether or not you watch dirty movies? Whether you're bankrupt? Who you owe money to. You know what else they can do? They can get your credit card...I don't know if it matters about being careful... This whole Orwellian thing is not funny. You know that people are falling in love with computers. I mean, with each other. There's X-rated computers... You know what they do? They have hot tub parties...Everybody's got a nickname and then if you connect with somebody during this party, you and that other person can go off by yourself onto this private channel, have a little more X-rated conversation, and then if you want, go back to the hot tub party."

—Phil Donahue on the *Donahue Show,* March 15, 1985

These revelations sure changed things, huh? These quotes, which were posted online because it was a show about going online, could have been written yesterday. Things do not change just because attention is focused on them.

Let me finish up this exercise in reality checking with some direct quotes from various editions of *Online Today* — a CompuServe News Service. All quotes are from 1985.

"One could be left with the impression that if we weren't going out of business, then we certainly were in some disarray. But Apple is stronger now than it was several months ago. The company is just focusing on managing growth more cautiously." — John Sculley, Apple Computer president and CEO, talking to a group of security analysts.

"The arrogance of computer companies and their executives has nearly destroyed the home computer market." — writer Michael S. Tomczyk, presenting the keynote address at the Anaheim Byte Computer Show

In addition to his weekly syndicated radio call-in show, *Software/Hardtalk*, syndicated newspaper columns, magazine writing for ***MacUser***, ***PC Computing***, ***DEC Professional***, ***Information Technology***, and his featured "*Inside Track*" column in ***PC Magazine***, Dvorak is the author of several best-selling books, including ***Dvorak's Inside Track to DOS & PC Performance***, ***Dvorak's Guide to PC Telecommunications***, and ***Dvorak's Inside Track to the Mac***. John can be reached at dvorak@aol.com

"It's going to be difficult to show any growth during the first half of 1985, and I don't see anything on the horizon that suggests we ought to change that forecast." — IBM chief John F. Akers, talking about his company's first half prospects.

"I never thought I would see IBM do something like this. It's going to hurt everyone's sales, and it will weaken the market." — William Gates, Microsoft Corp. chairman, commenting on IBM's decision to bundle software with PC XT models.

An interesting aspect of these CompuServe downloads is this is the year that CompuServe was almost sold to investors for **$72 million**.

I suppose I could go on for an entire magazine with ludicrous news stories and wacky quotes from people 10 and 15 years ago, and I suspect this treasure trove of old downloads will always come in handy. Remember that large capacity hard disks and optical drives are not just for bloated code but for old crap we should have discarded years ago. I'm convinced that most computer users are in some way or another pack rats. We're packing old information. Now, with close to 200 million web pages out there to collect, we'll be having a field day forever. ◆

Dvorak's Recipe Nook

Old Cooking and the Lost Recipe for Cucumber Catsup

As many of you know I have a penchant for uncovering old recipes from old or obscure cookbooks. I recently stumbled upon an 1891 *Cookery and Housekeeping Encyclopedia* published by the Mercantile Publishing Company. In it are what can only be described as strange recipes. There is so much of interest in this book I intend to reprint it someday in the future. In many ways it's a gold mine of information.

From this book I've learned a few things including the fact that eating duck rare was common before the turn of the century. I was under the impression that this was a new phenomenon. Another thing I learned was that people tended to eat more dairy products and less meat than you'd think — at least if you read pre-1900 information about recommended nutrition. I believe that this is why people were generally shorter than they are today. If you haven't noticed the most recent crop of kids (girls included) are generally taller than ever. I suspect this has something to do with the food chain, too.

The most interesting thing is this particular book is a wide variety of catsups. We associate catsup or ketchup with tomatoes and never consider that tomatoes may not have been the typical catsup in years gone by. In this book there is currant catsup, gooseberry catsup, plum catsup and cucumber catsup along with two version of tomato catsup. The following is the recipe for cucumber catsup.

Cucumber Catsup

Take one-half bushel of full-grown cucumbers, peel and chop them, sprinkle with salt, and put them in a sieve and let them stand over night; add two dozen onions, cut up mall, one half pound white mustard seed, one half pound black mustard seed, two ounces of black pepper, ground. Mix well with the best cider vinegar, making it the consistency of thick catsup, and fill your jars, tying up closely. It requires no cooking.

There is never any discussion as to exactly what this catsup is used for, but there is mention that any of these homemade catsups were to be used to add flavor to sauces and soups as needed. It's a bygone era. ◆

SETTING UP AN
INTERNET PRESENCE
SHOULDN'T FRAY
YOUR NERVES

THERE ARE ENOUGH COMPLEXITIES IN LIFE. CONNECTING TO THE INTERNET SHOULDN'T BE ONE OF THEM.

Creating an Internet presence can be a frustrating experience, even for the expert. Beyond the web server there are routers to make the connections, FTP to move the files, and e-mail servers to give your mail a home. And don't forget Domain Name Servers that are required so the world can know your name. Even after you gather all the pieces, you still have to integrate them. And the costs, in time and money, can be staggering. But now there is an easier way.

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The Internet Protocol Adapter (IPAD) is the only product that fully integrates a router, terminal server, and core Internet services (WWW, DNS, FTP, e-mail) into a single device. With all the necessary internal and external connections, Domain Name Service, and other required functions, IPAD includes everything needed to easily establish a complete Internet presence. In fact, it's so complete, you can add remote access by simply plugging in modems and dialing in with any Internet compatible computer.

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The IPAD's capability is housed in a rack-mount chassis of battle-ready construction. Its custom software, optimized for the Pentium processor, yields an unprecedented combination of performance and durability that you can never get from a general purpose operating system. The IPAD may be easy to use, but it's no toy.

	IPAD	Windows NT
Computer Hardware for Server CPU	Comparable performance $746S	166 Mhz Pentium, 2 GIG SCSI Disk, Ethernet, Coching Controller 96 MB RAM, $3S00
Router Software Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$1800 1-3 hrs $70 Avg $1870
System Software O/S Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$895 S-30 hrs $61S Avg $1510
Web Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	Included 3-2S hrs $490 Avg $490
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ONS Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$495 S-80 hrs $1600 Avg $2095
E-Mail Server Configuration Time Configuration Cost Sub Total	Included Pre-configured – –	$580 10-100 hrs $1900 Avg $2480
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And this ease of use doesn't stop there. With an IPAD even those who don't have formal training can confidently grow and maintain their own network.

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Infoworld Magazine said *"The IPAD represents an elegant solution when you need to easily build an Internet or Intranet presence. Considering the time it saves you, the price represents a good value."* In 1995 John C. Dvorak gave the IPAD his PC Telecommunications Excellence Award because he recognized the IPAD advantage.

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Legal and Legislative Issues

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Web Servers, Hosting and Design

Marketing Future Stategies

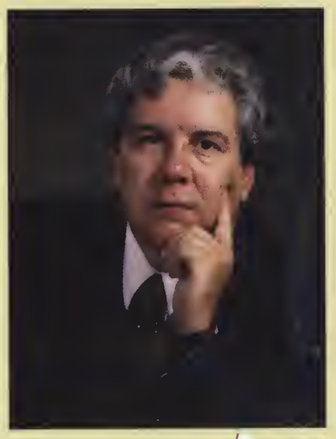
56k modem Technologies

xDSL

We would like to invite you to the largest national and indeed international meeting of Internet Service Providers ever held – this August 20-23 at The San Francisco Hilton and Towers in San Francisco. The Internet Service Provider Convention (ISPCON) promises to be the most exciting gathering of the year, not so much because of what it is, but rather because of who is coming – a huge percentage of the 3600 Internet Service Providers who actually operate the Internet and in so many ways large and small mold and shape its future.

Choose from an intense set of over one hundred educational sessions and seminars from broad legal and social issues to very specific technical sessions on BGP, multihoming, and xDSL for ISPs.

So join us for the largest mass meeting of Internet Service Providers and related professionals ever gathered. The information, perspective, and contacts gained at this one event may change your business plans forever – and toward their ultimate success.



Jack Rickard

Jack Rickard
Editor Boardwatch Magazine

Registration Form

August 20 - 23, 1997
San Francisco Hilton and Towers
333 O'Farrell Street, San Francisco

Mail or fax with payment to: ONE, Inc., ISPCON Registration,
8500 W. Bowles Avenue, Suite 210, Littleton, CO 80123. Fax: 303-973-3731

ISPCON *Registration Information*

The registration fee for the 1997 ISPCON is **$595**. This will allow you to take advantage of four intensive days of networking, educational sessions, and the most energized exhibit show floor in the industry.

Register Early and Save!
Registration Costs

Until July 1st	$425	**Save $170**
Until August 1st	$495	**Save $100**
After August 1st	**$595**	

Business Category: (please check only one)

- ❑ Internet Service Provider
- ❑ Reseller/Var
- ❑ Corporate/MIS
- ❑ Hardware Manufacturer
- ❑ Software Publisher
- ❑ Application Developer
- ❑ Cable & Telephone
- ❑ Government
- ❑ Education
- ❑ Other _____

Cancellations must be received in writing to *ONE, Inc.* by July 15, 1997. Refund amount is the purchase price less $75 processing fee.

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- ❑ Check enclosed (Make checks payable to ONE, Inc.)
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Credit Card #_____

Exp. Date_____ Total amount to charge_____

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Date_____

Hotel Reservation Information

This year ISPCON will again be headquartered at The San Francisco Hilton and Towers.
All educational sessions and show evening events will be hosted at the Hilton, making it THE place to stay while in town for ISPCON.

4 convenient options to make your reservation:

- Phone 800-933-6038 • 303-933-6038
- Fax 303-973-3731
- Mail ONE, Inc., ISPCON Registration
  8500 W. Bowles Ave., Suite 210
  Littleton, CO 80123
- Online http://www.ispcon.com

Those interested in exhibiting at ISPCON, should contact Bob Holley at (voice) 800-933-6038, 303-933-6038 or e-mail to bob.holley@boardwatch.com

❑ *Yes!* **Make My Reservations at the San Francisco Hilton and Towers**

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Reservations must be received by August 1st, 1997!

Arrival Date_____ Departure Date_____

Special ISPCON *Room Rates*

Check Room Type →
Each additional person is $20/night

- ❑ **Standard $150**
- ❑ **Superior $170**
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No. of Guests _____
No. of Beds _____
❑ **Smoking** ❑ **Non-Smoking**

A credit card is required to guarantee the reservation. SF Hilton will charge one night prepayment. This amount is refunded if reservation is cancelled 72 hours prior to arrival date.

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